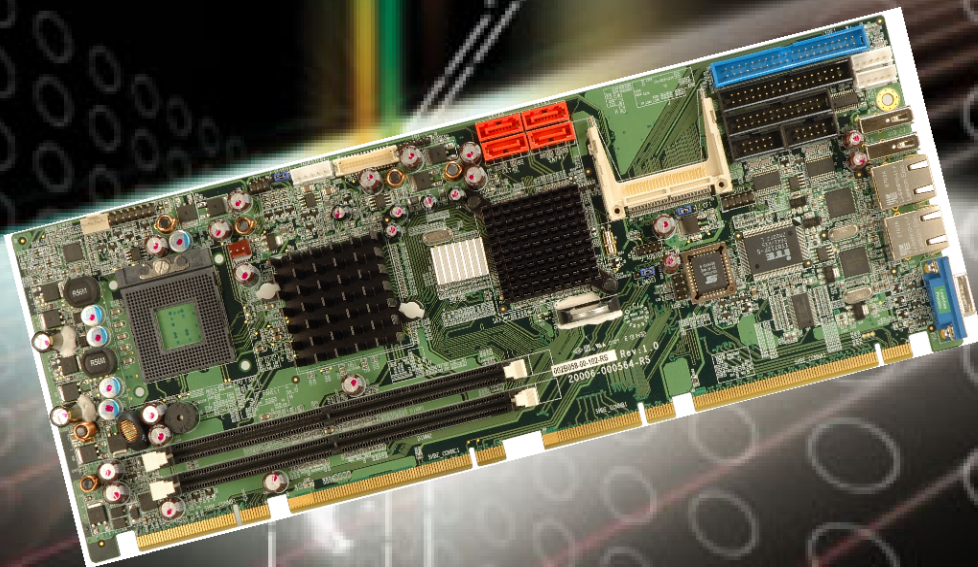




IEI Technology Corp .



MODEL: **PCIE-9452**

**Socket M Intel® Core™2 Duo/ Duo/ Solo or Celeron M
PICMG 1.3 CPU Card with Dual PCIe GBe, SATA II, USB 2.0
and PCIe x16, PCIe x4 and PCI expansion**

User Manual

Rev. 1.10 August 2007





Revision

Date	Version	Changes
2007-08-23	1.10	CF Compatibility enhanced Added "Appendix F: Hazardous Materials Disclosure" Changed all Socket 479 to Socket M
2007-05-02	1.00	Initial release

Manual Conventions



WARNING!

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously. Warnings are easy to recognize. The word “warning” is written as “**WARNING**,” both capitalized and bold and is followed by text. The text is the warning message. A warning message is shown below:



WARNING:

This is an example of a warning message. Failure to adhere to warning messages may result in permanent damage to the PCIE-9452 or personal injury to the user. Please take warning messages seriously.



CAUTION!

Cautionary messages should also be heeded to help reduce the chance of losing data or damaging the PCIE-9452. Cautions are easy to recognize. The word “caution” is written as “**CAUTION**,” both capitalized and bold and is followed. The italicized text is the cautionary message. A caution message is shown below:

**CAUTION:**

This is an example of a caution message. Failure to adhere to cautions messages may result in permanent damage to the PCIE-9452. Please take caution messages seriously.

**NOTE:**

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes. Notes are easy to recognize. The word “note” is written as “**NOTE**,” both capitalized and bold and is followed by text. The text is the cautionary message. A note message is shown below:

**NOTE:**

This is an example of a note message. Notes should always be read. Notes contain critical information about the PCIE-9452. Please take note messages seriously.

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Packing List



NOTE:

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the PCIE-9452 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The items listed below should all be included in the PCIE-9452 package.

- 1 x PCIE-9452 single board computer
- 1 x IDE cable
- 2 x SATA power cable
- 4 x SATA cables
- 1 x Dual RS-232 cable
- 1 x USB cable
- 1 x Mini jumper pack
- 1 x Utility CD
- 1 x 1 x QIG (quick installation guide)

Images of the above items are shown in **Chapter 3**.

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Glossary

AC '97	Audio Codec 97	HDD	Hard Disk Drive
ACPI	Advanced Configuration and Power Interface	IDE	Integrated Data Electronics
APM	Advanced Power Management	I/O	Input/Output
ARMD	ATAPI Removable Media Device	ICH4	I/O Controller Hub 4
ASKIR	Shift Keyed Infrared	L1 Cache	Level 1 Cache
ATA	Advanced Technology Attachments	L2 Cache	Level 2 Cache
BIOS	Basic Input/Output System	LCD	Liquid Crystal Display
CFII	Compact Flash Type 2	LPT	Parallel Port Connector
CMOS	Complementary Metal Oxide Semiconductor	LVDS	Low Voltage Differential Signaling
CPU	Central Processing Unit	MAC	Media Access Controller
Codec	Compressor/Decompressor	OS	Operating System
COM	Serial Port	PCI	Peripheral Connect Interface
DAC	Digital to Analog Converter	PIO	Programmed Input Output
DDR	Double Data Rate	PnP	Plug and Play
DIMM	Dual Inline Memory Module	POST	Power On Self Test
DIO	Digital Input/Output	RAM	Random Access Memory
DMA	Direct Memory Access	SATA	Serial ATA
EIDE	Enhanced IDE	S.M.A.R.T	Self Monitoring Analysis and Reporting Technology
EIST	Enhanced Intel SpeedStep Technology	SPD	Serial Presence Detect
FDD	Floppy Disk Drive	S/PDI	Sony/Philips Digital Interface
FDC	Floppy Disk Connector	SDRAM	Synchronous Dynamic Random Access Memory
FFIO	Flexible File Input/Output	SIR	Serial Infrared
FIFO	First In/First Out	UART	Universal Asynchronous Receiver-transmitter
FSB	Front Side Bus	USB	Universal Serial Bus
IrDA	Infrared Data Association	VGA	Video Graphics Adapter

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Chapter**1**

Introduction

1.1 Introduction

The PCIE-9452 PICMG 1.3 CPU card is a Socket M Intel® Core™2 Duo, Intel® Core™ Duo, Intel® Core™ Solo or Intel® Celeron M (Yohan core) CPU platform. The PCIE-9452 has a maximum front side bus (FSB) frequency of 667MHz and supports 667MHz 2GB dual channel memory modules. The PCIE-9452 also comes with multiple display option, dual PCI Express (PCIe) Gigabit Ethernet (GbE) and has flexible storage options including support for four second-generation serial ATA (SATA) hard disk drives (HDD), two IDE HDD, a CompactFlash® Type II (CF Type II) disk, and a floppy disk drive (FDD).

1.1.1 PCIE-9452 Benefits

Some of the PCIE-9452 benefits are listed below:

- Multiple display output options
- Storage flexibility with support for SATA II drives, IDE drives and CF Type II disks
- DDR2 support enables faster data transfers
- Multiple I/O interfaces provide connectivity to a broad range of external peripheral devices

1.1.2 PCIE-9452 Features

Some of the PCIE-9452 features are listed below.

- Support for the following Socket M processors:
 - Intel® Core™2 Duo
 - Intel® Core™ Duo
 - Intel® Core™ Solo
 - Intel® Celeron M
- Maximum FSB of 667MHz
- Maximum of 4GB dual-channel memory supported with two 240-pin dual channel 400MHz, 533MHz or 667MHz 2GB DDR2 DIMMs
- Four SATA II drives with transfer rates of 3.0Gb/s supported
- Intel® Matrix Storage Manager
- High performance PCIe GbE Ethernet controllers

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- Six USB 2.0 devices supported
- Multiple display options including CRT, 18-bit dual-channel LVDS and HDTV
- PICMG 1.3 form factor
- RoHS compliant

1.2 PCIE-9452 Overview

1.2.1 PCIE-9452 Overview Photo

The PCIE-9452 has a wide variety of internal and external peripheral connectors. A labeled photo of the peripheral connectors on the front of the PCIE-9452 is shown in Figure 1-1.

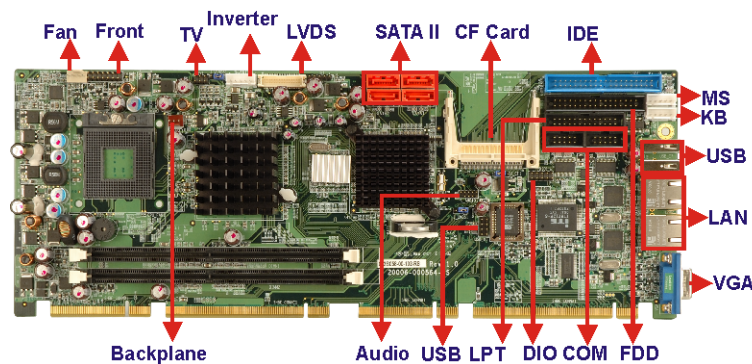


Figure 1-1: PCIE-9452 Overview [Front View]

1.2.2 PCIE-9452 Peripheral Connectors and Jumpers

The PCIE-9452 has the following connectors on-board:

- 1 x Audio connector
- 1 x Backplane power connector
- 1 x Compact flash connector
- 1 x Digital input/output connector
- 1 x Fan connector
- 1 x Floppy disk drive (FDD) connector
- 1 x Front panel connector
- 1 x IDE disk drive connector
- 1 x Infrared interface connector

- 1 x Inverter connector
- 1 x Keyboard connector
- 1 x LVDS connector
- 1 x Mouse connector
- 2 x Serial port connectors (internal COM 1 and COM 2 RS-232)
- 1 x Parallel port connector
- 4 x Serial ATA (SATA) drive connectors
- 1 x TV output connector
- 2 x USB connectors

The PCIE-9452 has the following external peripheral interface connectors on the board rear panel

- 2 x Ethernet connectors
- 2 x USB port connectors
- 1 x VGA connector

The PCIE-9452 has the following on-board jumpers:

- Clear CMOS
- LCD voltage selector
- CF card setting

1.2.3 Technical Specifications

PCIE-9452 technical specifications are listed in **Table 1-1**. See **Chapter 2** for details.

Specification	PCIE-9452
Form Factor	PICMG 1.3
System CPU	Socket M Intel® Core™2 Duo Socket M Intel® Core™ Duo Socket M Intel® Core™ Solo Socket M Intel® Celeron M (Yonah core)
Front Side Bus	400MHz, 533Mhz, or 667MHz

PCIE-9452 PICMG 1.3 CPU Card

Specification	PCIE-9452
System Chipset	Northbridge: Intel® 945GM Southbridge: Intel® ICH7R
Memory	Two 240-pin DIMM sockets support two dual-channel 400MHz, 533MHz or 667MHz DDR2 DIMMs with a maximum capacity of 2GB each
Display	CRT: Integrated in the Intel® 945GM to support CRT LVDS: Dual channel 18-bit LVDS LCD panel HDTV: Supports resolutions up to 1080i / 1080P by component interface
BIOS	AMI Flash BIOS
Audio	7.1 channel or 5.1 channel audio with an optional AC-KIT
LAN	Dual PCIe GbE Broadcom BCM5787M chipsets
COM	Two RS-232 serial ports
USB2.0	Eight USB 2.0 devices supported, two on the bracket, two by pin header on board and four on the backplane
IDE	One 40-pin IDE connects to two Ultra ATA33/66/100 devices
Floppy Disk Drive	One FDD connector connects to a single FDD
SATA	Four 3.0Gb/s SATA drives supported
Keyboard/mouse	One 5-pin connector connects to a keyboard One 5-pin connector connects to a mouse
Super I/O	ITE IT8712F
Digital I/O	One 8-bit digital I/O connector (4-bit input / 4-bit output)
Infrared	One Infrared connector

Specification	PCIE-9452
SSD	CF Type II
Watchdog Timer	Software programmable 1-255 sec. by super I/O
Power Supply	ATX supported
Temperature	0°C – 60°C (32°F - 140°F)
Humidity (operating)	5%~95% non-condensing
Dimensions (LxW)	338mm x 126mm
Weight (GW/NW)	1100g/ 380g

Table 1-1: Technical Specifications

Chapter

2

Detailed Specifications

2.1 Overview

This chapter describes the specifications and on-board features of the PCIE-9452 in detail.

2.2 Dimensions

2.2.1 Board Dimensions

The dimensions of the board are listed below:

- **Length:** 338mm
- **Width:** 126mm

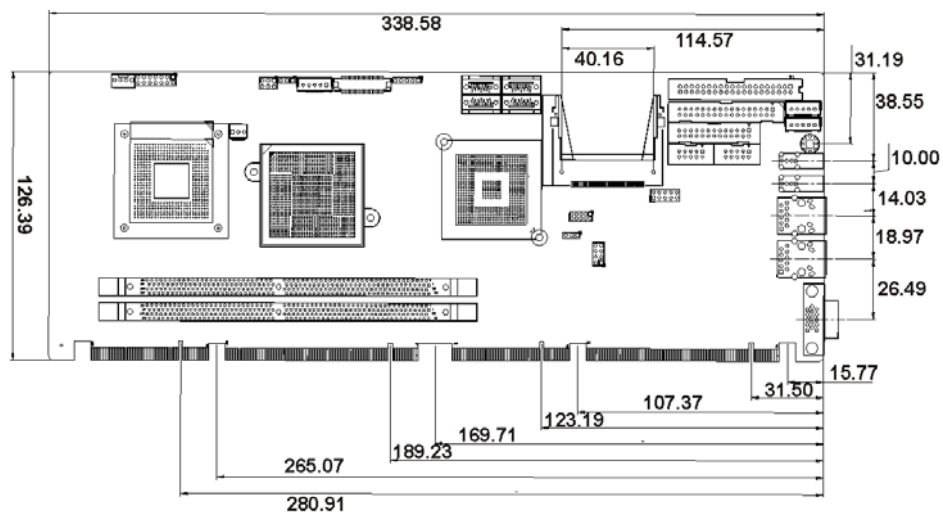


Figure 2-1: PCIE-9452 Dimensions (mm)

2.2.2 External Interface Panel Dimensions

External peripheral interface connector panel dimensions are shown in **Figure 2-2**.

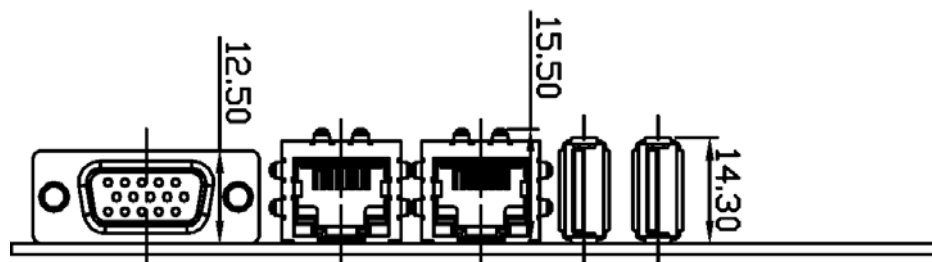


Figure 2-2: External Interface Panel Dimensions (mm)

2.3 Data Flow

Figure 2-3 shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.

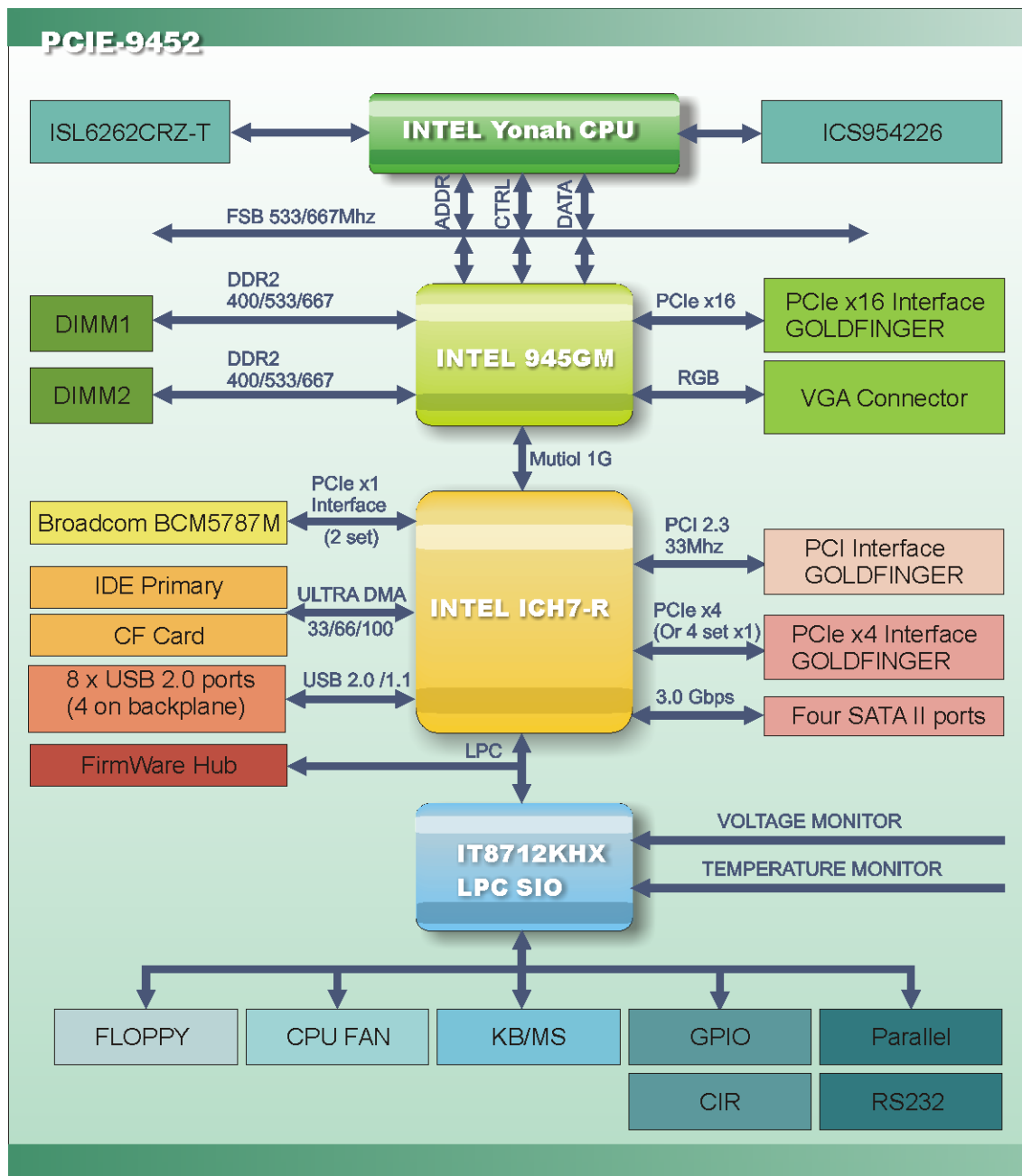


Figure 2-3: Data Flow Block Diagram

2.4 Compatible Processors

2.4.1 Compatible Processor Overview

The PCIE-9452 supports the following Socket M processors:

- Intel® Core™2 Duo Mobile processors
- Intel® Core™ Duo processors
- Intel® Core™ Solo processors
- Intel® Celeron® M processors

All three of the above processors communicate with the Intel® 945GM northbridge chipset through a 667MHz front side bus (FSB). Features of the supported processors are listed in

Table 2-1.

CPU Features	Core™2 Duo Mobile	Core™ Duo	Core™ Solo	Celeron® M
Dual core	Yes	Yes	No	No
Enhanced Halt State (C1E)	No	Yes	No	No
Enhanced Intel® Speedstep® Technology	Yes	Yes	Yes	No
Execute Disable Bit	Yes	Yes	Yes	Yes
Intel® EM64T	Yes	No	No	No
Intel® Virtualization Technology	Yes	Yes	No	No

Table 2-1: Processor Features

2.4.2 Supported Processors

Specifications for the compatible processors are listed in **Table 2-2** below:

Family	CPU Speed	Processor #	Bus Speed	Mfg Tech	Stepping	Cache Size
Core™2 Duo Mobile	2.33 GHz	T7600	667 MHz	65 nm	B2	4 MB
	2.16 GHz	T7400	667 MHz	65 nm	B2	4 MB

Family	CPU Speed	Processor #	Bus Speed	Mfg Tech	Stepping	Cache Size
	2 GHz	T7200	667 MHz	65 nm	B2	4 MB
	1.83 GHz	T5600	667 MHz	65 nm	B2	2 MB
	1.66 GHz	T5500	667 MHz	65 nm	B2	2 MB
Core™ Duo	2 GHz	T2500	667 MHz	65 nm	C0	2 MB
	1.66 GHz	T2300E	667 MHz	65 nm	C0	2 MB
Core™ Solo	1.83 GHz	T1400	667 MHz	65 nm	C0	2 MB
Celeron® M	2 GHz	450	533 MHz	65 nm	D0	1 MB
	1.86 GHz	440	533 MHz	65 nm	D0	1 MB
	1.73 GHz	430	533 MHz	65 nm	C0	1 MB
	1.73 GHz	430	533 MHz	65 nm	D0	1 MB
	1.73GHz	530	533 MHz	65 nm	-	1 MB
	1.60 GHz	520	533 MHz	65 nm	B2	1 MB
	1.46 GHz	410	533 MHz	65 nm	C0	1 MB

Table 2-2: Supported Processors

2.5 Intel® 945GM Northbridge Chipset

2.5.1 Intel® 945GM Overview

The Intel® 945GM northbridge chipset has the Generation 3.1 Intel Integrated Graphics Engine and the Intel® Graphics Media Accelerator 950 (Intel® GMA 950). The integrated graphics and memory controller hub (GMCH) facilitates the flow of information primarily between the following four interfaces:

- Front Side Bus (FSB)
- System Memory Interface
- Graphics Interface
- Direct Media Interface (DMI)

PCIE-9452 PICMG 1.3 CPU Card

2.5.2 Intel® 945GM Memory Support



WARNING:

Only DDR2 memory module can be installed on the PCIE-9452. Do not install DDR memory modules. If a DDR memory module is installed on the PCIE-9452, the PCIE-9452 may be irreparably damaged.

The Intel® 945GM northbridge chipset on the PCIE-9452 supports two DDR2 240-pin DIMMs with the following features:

- Two 240-pin DIMMs
- DDR2 only (**DO NOT** install a DDR DIMM)
- Single-channel or dual-channel
- Capacities of 256MB, 512MB, 1GB or 2GB
- Transfer speeds of 400MHz, 533MHz or 667MHz
- 64-bit wide channel

The memory socket is shown in **Figure 2-4**.

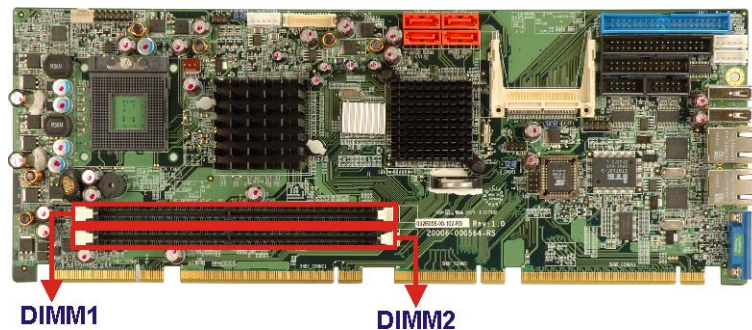


Figure 2-4: 240-pin DDR2 DIMM Socket

2.5.3 Intel® 945GM PCIe x16

2.5.3.1 PCIe x16 Bus Overview

The Intel® 945GM northbridge chipset has a dedicated 16-lane PCIe port for an external PCIe x16 graphics card. The PCIe x16 graphics card is installed on a compatible PICMG 1.3 backplane and interfaced to the northbridge through the two golden fingers shown in **Figure 2-5**. Note that the 16 lanes of the PCIe x16 northbridge bus are connected to two golden fingers.

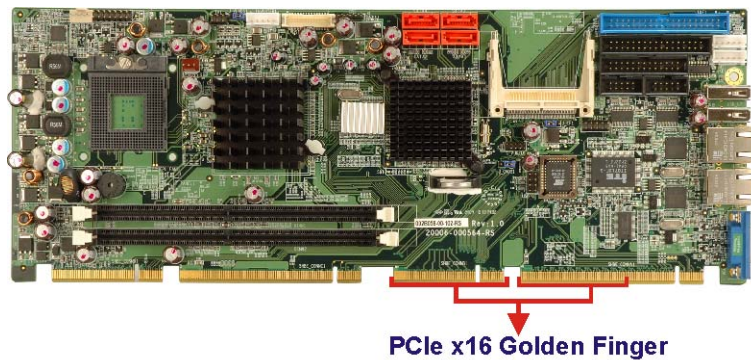


Figure 2-5: PCIe x16 Golden Fingers

2.5.3.2 PCIe x16 Expansion Options

The PCIe x16 can be interfaced to either one PCIe x16 graphics card or a single PCIe x1 expansion card on a compatible PICMG 1.3 backplane.

2.5.3.3 PCIe x16 Bus Specifications

Some of the PCIe x16 bus specifications are listed below.

- Compliant with the current PCI Express Base Specification base PCIe frequency of 2.5GHz
- Raw bit rate on the pins is 250Gb/s
- Maximum theoretical bandwidth of 4GB/s in each direction resulting in an 8GB/s bandwidth when in PCIe x16 mode
- 100MHz differential reference clock

PCIE-9452 PICMG 1.3 CPU Card

- PCIe power management support
- L0, L1, L2/L3 ready, L3
- Hierarchical PCI compliant configuration mechanism for downstream components
- PCIe extended configuration space
- PCIe enhanced addressing mechanism
- Supports traditional PCI traffic
- Supports traditional AGP traffic
- APIC and MSI messaging support

2.5.4 Intel® 945GM Integrated Graphics

The Intel® 945GM northbridge chipset has an Intel® Gen. 3.5 integrated graphics engine that supports the following display devices:

- Analog CRT
- LVDS
- TV-Out

2.5.4.1 Intel® 945GM Analog CRT Support

A DB-15 VGA connector on the external peripheral interface connector panel is interfaced to the Intel® 945GM graphics engine. The Intel® 945GM internal graphics engine, with an integrated 400MHz RAMDAC and hot plug CRT support, supports analog CRT monitors up to QXGA.

2.5.4.2 Intel® 945GM LVDS Support

A 30-pin LVDS crimp connector is interfaced to the Intel® 945GM graphics engine. The Intel® 945GM internal graphics engine supports LVDS displays with the following features:

- Up to UXGA monitors with a maximum resolution of 1600 x 1200
- 18-bit 25MHz to 112MHz single-channel or dual-channel LVDS screens
- CPIS 1.5 compliant LVDS screens

2.5.4.3 Intel® 945GM TV Out Support

A 6-pin TV output connector is interfaced to the Intel® 945GM graphics engine. The Intel® 945GM internal graphics engine has the following TV output features:

- Three integrated 10-bit DACs
- Macrovision support
- Overscaling
- NTSC and PAL formats supported
- Supports RCA connectivity
- Supports HDTV (via Component output) with the following resolutions:
 - 480p
 - 720p
 - 1080i

2.5.5 Intel® 945GM Direct Media Interface (DMI)

Intel® 945GM northbridge GMCH is connected to the Intel® ICH7R Southbridge Chipset through the chip-to-chip Direct Media Interface (DMI). Features of the Intel® 945GM DMI are listed below:

- 2GB/s (1GB/s in each direction) bus speed
- 32-bit downstream address

2.6 Intel® ICH7R Southbridge Chipset

2.6.1 Intel® ICH7R Overview

The Intel® ICH7R southbridge chipset is connected to the Intel® 945GM northbridge GMCH through the chip-to-chip Direct Media Interface (DMI). Some of the features of the Intel® ICH7R are listed below.

- Complies with PCI Express Base Specification, Revision 1.0a
- Complies with PCI Local Bus Specification, Revision 2.3 and supports 33MHz PCI operations
- Supports ACPI Power Management Logic
- Contains:
 - Enhanced DMA controller
 - Interrupt controller
 - Timer functions
- Integrated SATA host controller with DMA operations interfaced to four SATA connectors on the PCIE-9452
- Integrated IDE controller supports Ultra ATA 100/66/33
- Supports the four USB 2.0 devices on the PCIE-9452 with four UHCI controllers and one EHCI controller
- Complies with System Management Bus (SMBus) Specification, Version 2.0
- Supports Audio Codec '97 (AC'97) Revision 2.3
- Supports Intel® High Definition Audio
- Contains Low Pin Count (LPC) interface
- Supports Firmware Hub (FWH) interface
- Serial peripheral interface support

2.6.2 Intel® ICH7R Audio Codec '97 Controller

The Audio Codec '97 (AC'97) controller integrated into the ICH7R complies with AC'97 Component Specification, Version 2.3. The AC'97 controller is connected to the onboard audio connector. The audio connector is connected to an optional 5.1 channel or 7.1 channel audio kit with an embedded AC'97 audio codec. The AC'97 controller supports up

to six PCM audio output channels. Complete surround sound requires six-channel audio consisting of:

- Front left
- Front right
- Back left
- Back right
- Center
- Subwoofer

2.6.3 Intel® ICH7R IDE Interface

The integrated IDE interface on the ICH7R southbridge supports two IDE hard disks and ATAPI devices. PIO IDE transfers up to 16MB/s and Ultra ATA transfers of 100MB/s. The integrated IDE interface is able to support the following IDE HDDs:

- **Ultra ATA/100**, with data transfer rates up to 100MB/s
- **Ultra ATA/66**, with data transfer rates up to 66MB/s
- **Ultra ATA/33**, with data transfer rates up to 33MB/s

Specification	Ultra ATA/100	Ultra ATA/66	Ultra ATA/33
IDE devices	2	2	2
PIO Mode	0 – 4	0 – 4	0 – 4
PIO Max Transfer Rate	16.6 MB/s	16.6 MB/s	16.6 MB/s
DMA/UDMA designation	UDMA 3 - 4	UDMA 3 – 4	UDMA 2
DMA/UDMA Max Transfer	100MB/s	66MB/s	33MB/s
Controller Interface	5V	5V	5V

Table 2-3: Supported HDD Specifications

2.6.4 Intel® ICH7R Low Pin Count (LPC) Interface

The ICH7R LPC interface complies with the LPC 1.1 specifications. The LPC bus from the ICH6 is connected to the following components:

- BIOS chipset
- Super I/O chipset

2.6.5 Intel® ICH7R PCI Interface

The PCI interface on the ICH7R is compliant with the PCI Revision 2.3 implementation. Some of the features of the PCI interface are listed below.

- PCI Revision 2.3 compliant
- 33MHz
- 5V tolerant PCI signals (except PME#)
- Integrated PCI arbiter supports up to seven PCI bus masters

The PCI bus is connected to an interface gold finger on the bottom of the CPU cards and supports four expansion PCI cards on the backplane.

2.6.6 Intel® ICH7R Real Time Clock

256 bytes of battery backed RAM is provided by the Motorola MC146818A real time clock (RTC) integrated into the ICH6. The RTC operates on a 3V battery and 32.768KHz crystal. The RTC keeps track of the time and stores system data even when the system is turned off.

2.6.7 Intel® ICH7R SATA Controller

The integrated SATA controller on the ICH7R southbridge supports four SATA drives on the PCIE-9452 with independent DMA operations. SATA controller specifications are listed below.

- Supports four SATA drives
- Supports 3Gb/s data transfer speeds

- Supports Serial ATA Specification, Revision 1.0a

2.6.8 Intel® ICH7R USB Controller

2.6.8.1 Intel® ICH7R USB Controller Overview

Up to eight high-speed, full-speed or low-speed USB devices are supported by the ICH7R on the PCIE-9452. High-speed USB 2.0, with data transfers of up to 480MB/s, is enabled with the ICH7R integrated Enhanced Host Controller Interface (EHCI) compliant host controller. USB full-speed and low-speed signaling is supported by the ICH7R integrated Universal Host Controller Interface (UHCI) controllers.

2.6.8.2 PCIE-9452 USB Implementation

Only four of the Intel® ICH7R USB ports are implemented on the PCIE-9452. Two ports are connected to two external connectors and two ports are connected to an 8-pin onboard header. See **Figure 2-6**.

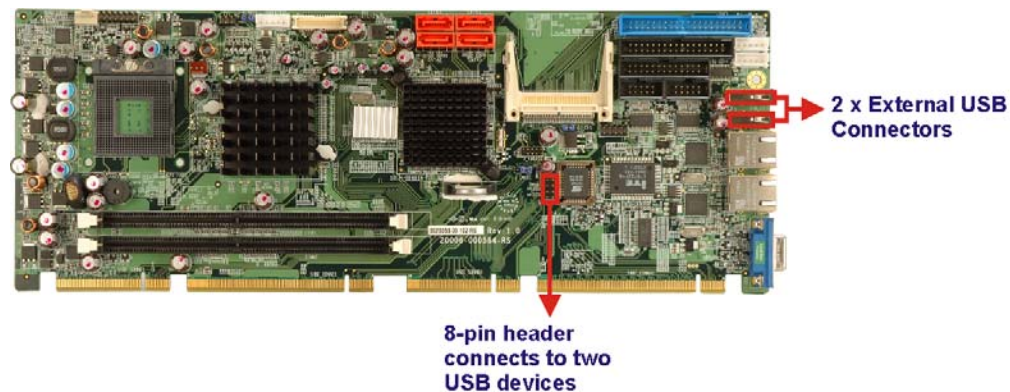


Figure 2-6: Onboard USB Implementation

2.6.8.3 Backplane USB Implementation

The remaining four Intel® ICH7R USB ports are interfaced to the backplane through a golden finger on the bottom of the CPU card. See **Figure 2-7**. These four remaining USB ports can be implemented through connectors on the backplane.

PCIE-9452 PICMG 1.3 CPU Card

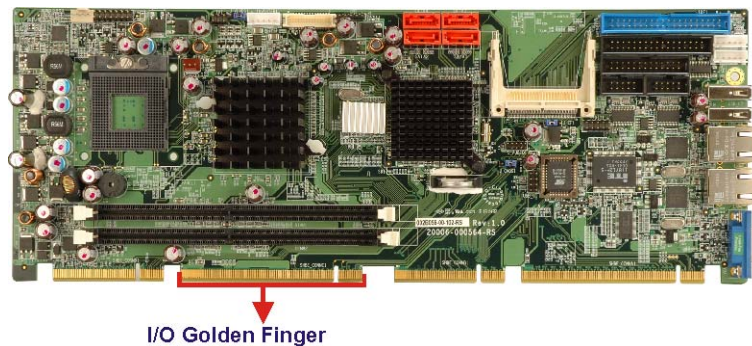


Figure 2-7: I/O Golden Finger

2.6.9 Intel® ICH7R PCIe Bus

2.6.9.1 Intel® ICH7R PCIe Bus Overview

The Intel® ICH7R southbridge chipset has six PCIe lanes. Two of the PCIe lanes are connected to two Broadcom PCIe GbE Ethernet controllers. The remaining four PCIe lanes are interfaced through a golden finger on the bottom of the CPU card through the backplane to either four PCIe x1 expansion cards or one PCIe x4 expansion card.

2.6.9.2 PCIe x4 Expansion Options

Four PCIe x1 expansion cards or one PCIe x4 expansion card can be installed onto a compatible PICMG 1.3 backplane and are interfaced through the PCIe x4 golden finger on the bottom of the PCIE-9452 to the southbridge chipset. The PCIe x4 golden finger is shown in **Figure 2-8** below.

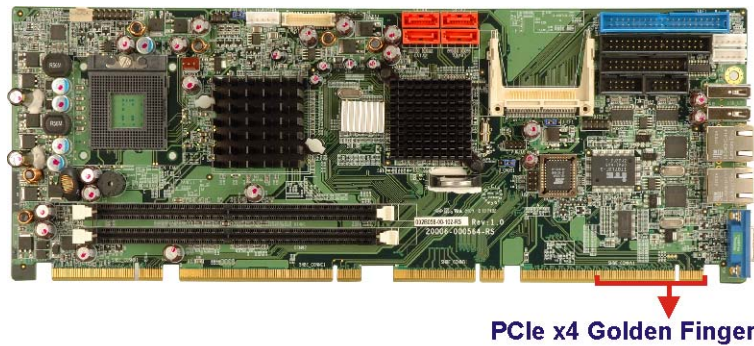


Figure 2-8: PCIe x4 Golden finger

2.6.9.3 PCIe GbE Ethernet

Two PCIe x1 lanes are connected to two Broadcom BCM5787M PCIe GbE controllers shown in **Figure 2-9** below.

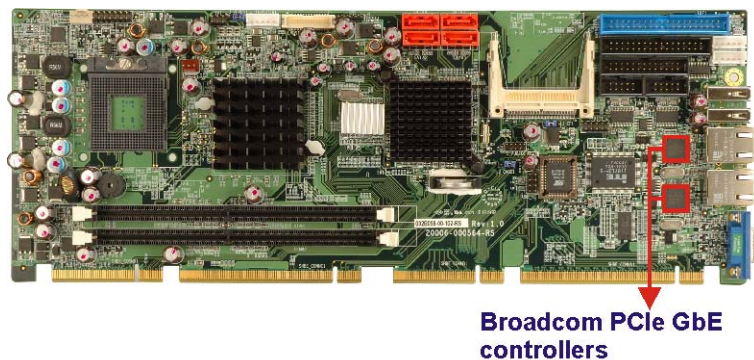


Figure 2-9: Broadcom PCI GbE Controllers

The Broadcom BCM5787M is a 10/100/1000BASE-T Ethernet LAN controller. The BCM5787M combines a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, a PCIe bus interface, and an on-chip buffer memory. Some of the BCM5787 controller features are listed below:

- Integrated 10/100/1000BASE-T transceiver
- Automatic MDI crossover function
- PCIe v1.0a
- 10/100/1000BASE-T full/half-duplex MAC

PCIE-9452 PICMG 1.3 CPU Card

- Wake on LAN support meeting the ACPI requirements
- Statistics for SNMP MIB II, Ethernet-like MIB, and Ethernet MIB (802.3z, clause 30)
- Serial EEPROM or serial flash support
- JTAG support

2.7 LPC Bus Components

2.7.1 LPC Bus Overview

The LPC bus is connected to components listed below:

- BIOS chipset
- Super I/O chipset

2.7.2 BIOS Chipset

The BIOS chipset has a licensed copy of AMI BIOS installed on the chipset. Some of the BIOS features are listed below:

- AMI Flash BIOS
- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (Pre-boot Execution Environment) support
- USB booting support

The BIOS chipset is shown in **Figure 2-10** below.

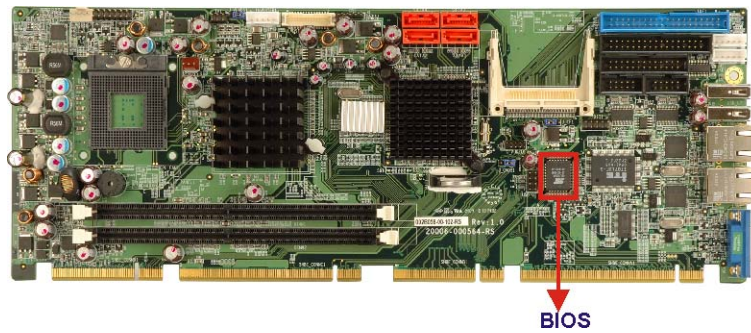


Figure 2-10: BIOS Chipset

2.7.3 Super I/O chipset

The iTE IT8712F Super I/O chipset is connected to the ICH7 southbridge through the LPC bus. The iTE IT8712F is an LPC interface-based Super I/O device that comes with Environment Controller integration.

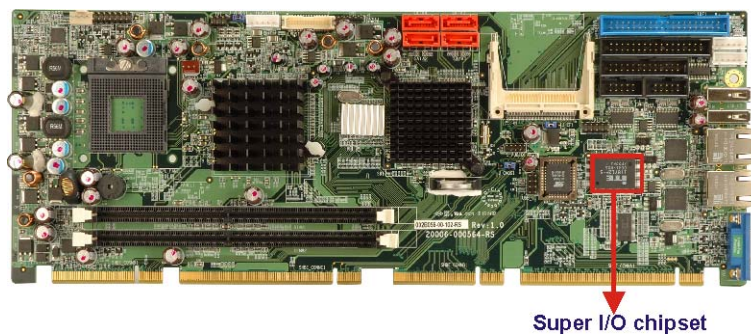


Figure 2-11: Super I/O Chipset

Some of the features of the iTE IT8712F chipset are listed below:

- LPC Interface
- PC98/99/2001, ACPI and LANdesk Compliant
- Enhanced Hardware Monitor
- Fan Speed Controller
- SmartGuardian Controller
- Single +5V Power Supply
- Two 16C550 UARTs for serial port control
- One IEEE 1284 Parallel Port
- Floppy Disk Controller

PCIE-9452 PICMG 1.3 CPU Card

- Keyboard Controller
- Watchdog Timer
- Serial IRQ Support
- Vbat & Vcch Support
- Single +5V Power Supply

Some of the Super I/O features are described in more detail below:

2.7.3.1 Super I/O LPC Interface

The LPC interface on the Super I/O complies with the Intel® Low Pin Count Specification Rev. 1.0. The LPC interface supports both LDRQ# and SERIRQ protocols as well as PCI PME# interfaces.

2.7.3.2 Super I/O 16C550 UARTs

The onboard Super I/O has two integrated 16C550 UARTs that can support the following:

- Two standard serial ports (COM1 and COM2)
- IrDa 1.0 and ASKIR protocols

Another two chipsets connected to the LPC bus provided connectivity to another two serial port connectors (COM3 and COM4).

2.7.3.3 Super I/O Enhanced Hardware Monitor

The Super I/O Enhanced Hardware Monitor monitors three thermal inputs, VBAT internally, and eight voltage monitor inputs. These hardware parameters are reported in the BIOS and can be read from the BIOS Hardware Health Configuration menu.

2.7.3.4 Super I/O Fan Speed Controller

The Super I/O fan speed controller enables the system to monitor the speed of the fan. One of the pins on the fan connector is reserved for fan speed detection and interfaced to the fan speed controller on the Super I/O. The fan speed is then reported in the BIOS.

2.7.3.5 Super I/O Parallel Port

The Super I/O parallel port (LPT) supports standard mode, enhanced mode and high-speed mode parallel port devices. The LPT is compliant with the following LPT modes.

- Standard mode
 - Bi-directional SPP compliant
- Enhanced mode
 - EPP v1.7 compliant
 - EPP v1.9 compliant
- High-speed mode
 - ECP, IEEE 1284 compliant

2.7.3.6 Super I/O Keyboard Controller

The Super I/O keyboard controller can execute the 8042 instruction set. Some of the keyboard controller features are listed below:

- The 8042 instruction is compatible with a PS/2 keyboard and PS/2 mouse
- Gate A20 and Keyboard reset output
- Supports multiple keyboard power on events
- Supports mouse double-click and/or mouse move power on events

2.8 Environmental and Power Specifications

2.8.1 System Monitoring

Three thermal inputs on the PCIE-9452 Super I/O Enhanced Hardware Monitor monitor the following temperatures:

- System temperature
- Power temperature
- CPU temperature

Eight voltage inputs on the PCIE-9452 Super I/O Enhanced Hardware Monitor monitor the following voltages:

PCIE-9452 PICMG 1.3 CPU Card

- Vcore
- +2.5V
- +3.3V
- +5.0V
- +12.0V
- DDR Vtt
- +1.5V
- 5VSB

The PCIE-9452 Super I/O Enhanced Hardware Monitor also monitors the following voltages internally:

- VBAT

The PCIE-9452 Super I/O Enhanced Hardware Monitor also monitors the following fan speeds:

- CPU Fan speed

The values for the above environmental parameters are all recorded in the BIOS Hardware Health Configuration menu.

2.8.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the PCIE-9452 are listed below.

- Minimum Operating Temperature: 0°C (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A cooling fan and heat sink must be installed on the CPU. Thermal paste must be smeared on the lower side of the heat sink before it is mounted on the CPU. Heat sinks are also mounted on the northbridge and southbridge chipsets to ensure the operating temperature of these chips remain low.

2.8.3 Power Consumption

Table 2-4 shows the power consumption parameters for the PCIE-9452 running with a 2.06GHz Intel® Core® 2 Duo T7200 processor through a 667MHz FSB and with 1GB of 667MHz DDR2 memory.

Voltage	Current
+3.3V	0.72A
+5V	4.14A
+12V	2.9A

Table 2-4: Power Consumption

2.9 Expansion Options

2.9.1 Expansion Options Overview

A number of compatible IEI Technology Corp. PICMG 1.3 backplanes and chassis can be used to develop and expanded system. These backplanes and chassis are listed below.

2.9.2 IEI Expansion PICMG 1.3 Backplanes

The backplanes listed in **Table 2-5** are compatible with the PCIE-9452 and can be used to develop highly integrated industrial applications. All of the backplanes listed below have 24-pin ATX connector and a 4-pin ATX connector. For more information about these backplanes please consult the IEI catalog or contact your vendor, reseller or the IEI sales team at sales@iei.com.tw.

Model	Revision	Total Slots	System	Expansion Slots					System Type
				PCIe			PCI		
				x16	x4	x1	PCI	PCI-X	
PE-4S	2.0 or later	4	One	1	1	-	1	-	Single
PE-4S2	2.0 or later	4	One	1	-	-	2	-	Single
PE-5S	2.0 or later	5	One	1	1	-	2	-	Single

PCIE-9452 PICMG 1.3 CPU Card

Model	Revision	Total Slots	System	Expansion Slots					System Type
				PCIe			PCI		
				x16	x4	x1	PCI	PCI-X	
PE-6S	3.0 or later	6	One	1	-	-	3	-	Single
PE-6S2	2.0 or later	6	One	1	1	-	3	-	Single
PE-6S3	2.0 or later	6	One	1	-	3	1	-	Single
PE-6SD2	2.0 or later	5	One	1	-	2	1	-	Single
PE-6SD3	2.0 or later	5	One	1	1	-	2	-	Single
PE-7S	2.0 or later	7	One	1	-	2	3	-	Single
PE-7S2	2.0 or later	7	One	1	-	4	1	-	Single
PE-8S	2.0 or later	8	One	1	-	3	3	-	Single
PE-9S	2.0 or later	9	One	1	-	4	3	-	Single
PE-10S	3.0 or later	10	One	1	-	4	4	-	Single
PE-10S2	2.0 or later	10	One	1	-	4	4	-	Single
PE-13SD	2.0 or later	13	Two	2	1	4	4	-	Dual
PXE-5S	2.0 or later	4	Single	1	-	-	1	1	Single
PXE-13S	2.0 or later	13	One	1	-	3	8	-	Single
PXE-19S	2.0 or later	19	One	1	-	1	16	-	Single

Table 2-5: Compatible IEI PICMG 1.3 Backplanes

2.9.3 IEI Chassis

IEI chassis available for PCIE-9452 system development are listed in **Table 2-6**.

For more information about these chassis please consult the IEI catalog or contact your vendor, reseller or the IEI sales team at sales@iei.com.tw.

Model	Slot SBC	Mounting	Max Slots	Backplanes
PAC-42GF-R20	Full-size	Wall	4	PE-4S PE-4S2 PE-4S3
PACO-504F	Full-size	Wall	4	PE-4S PE-4S2 PE-4S3
PAC-106G-R20	Full-size	Wall	6	PE-5S PE-5S2 PE-6S2 PE-6S3
PAC-107G-R20	Full-size	Wall	6	PE-5S PE-5S2 PE-6S2 PE-6S3
RACK-500G-R20	Full-size (4U)	Rack	5	PE-5S PE-5S2
RACK-305G-R20	Full-size (4U)	Rack	14	PE-6S-R20 PE-10S-R20 PE-10S2 PE-13SD PXE-13S PXE-19S
RACK-360G-R20	Full-size (4U)	Rack	14	PE-6S-R20 PE-10S-R20 PE-10S2 PE-13SD PXE-13S
RACK-814G-R20	Full-size (4U)	Rack	14	PE-6S-R20 PE-10S-R20 PE-10S2 PE-13SD PXE-13S

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Model	Slot SBC	Mounting	Max Slots	Backplanes
RACK-3000G-R20	Full-size (4U)	Rack	14	PE-6S-R20 PE-10S-R20 PE-10S2 PE-13SD PXE-13S PXE-19S
PAC-1700G-R20	Full-size	Wall	7	PE-6S-R20 PE-7S PE-7S2
PAC-125G-R20	Full-size	Wall	10	PE-6S-R20 PE-8S
PAC-1000G-R20	Full-size	Wall	6	PE-6S2 PE-6S3
PACO-506F	Full-size	Wall	6	PE-6S2 PE-6S3
RACK-221G	Full-size (2U)	Rack	6	PE-6SD PE-6SD2
RACK-2100G	Full-size (2U)	Rack	6	PE-6SD PE-6SD2

Table 2-6: Compatible IEI Chassis



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Chapter

3

Unpacking

3.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the PCIE-9452 may result in permanent damage to the PCIE-9452 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PCIE-9452. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the PCIE-9452, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband:*** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding:*** - Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring the PCIE-9452, place it on an anti-static pad. This reduces the possibility of ESD damaging the PCIE-9452.
- ***Only handle the edges of the PCB:*** - When handling the PCB, hold the PCB by the edges.

3.2 Unpacking

3.2.1 Unpacking Precautions

When the PCIE-9452 is unpacked, please do the following:

- Follow the anti-static precautions outlined in Section 3.1.
- Make sure the packing box is facing upwards so the PCIE-9452 does not fall out of the box.
- Make sure all the components shown in Section 3.3 are present.

PCIE-9452 PICMG 1.3 CPU Card

3.3 Unpacking Checklist







Note:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the PCIE-9452 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

3.3.1 Package Contents

The PCIE-9452 is shipped with the following components:

Quantity	Item and Part Number	Image
	PCIE-9452	
1	ATA 66/100 flat cable (P/N: 32200-000052-RS)	
4	SATA cable (P/N: 32000-062800-RS)	
2	SATA power cable (P/N: 32100-088600-RS)	
1	Dual RS-232 cable (P/N: 19800-000051-RS)	





1	Dual USB cable (w bracket) (P/N :CB-USB02-RS)	
1	Mini jumper pack	
1	Quick installation guide	
1	Utility CD	

Table 3-1: Package List Contents

PCIE-9452 PICMG 1.3 CPU Card







3.3.2 Optional Items



NOTE:

The items listed in this section are optional items that must be ordered separately. Please contact your PCIE-9452 vendor, distributor or reseller for more information or, contact iEi directly by sending an email to sales@iei.com.tw.

The following optional items are available for the PCIE-9452.

Quantity	Item and Part Number	Image
1	Audio kit_ 5.1 Channel (P/N: AC-KIT08R-R10)	
1	Audio kit_ 7.1 Channel (P/N: AC-KIT-883HD-R10)	
1	Cooling Kit (P/N: CF-479B-RS)	
1	5-pin Wafer to PS/2 cable (P/N:32000-000075-RS)	
1	LPT cable (P/N:19800-000049-RS)	
1	FDD cable (P/N:32200-000017-RS)	



Quantity	Item and Part Number	Image
1	HDTV Cable Set comprises a S-Video cable and a TV-out cable (P/N: HDTVCABLESET-01)	
	TV-out extension cable with Composite / S-Video / Component output (Max.1080i HDTV resolution supported) (P/N: 32000-083100-RS)	
	TV-out cable with 7-pin mini din on bracket (P/N: 19800-000067-RS)	

Table 3-2: Optional Items

Chapter

4

Connector Pinouts

4.1 Peripheral Interface Connectors

Section 4.1.2 shows peripheral interface connector locations. **Section 4.1.2** lists all the peripheral interface connectors seen in **Section 4.1.2**.

4.1.1 PCIE-9452 Layout

Figure 4-1 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

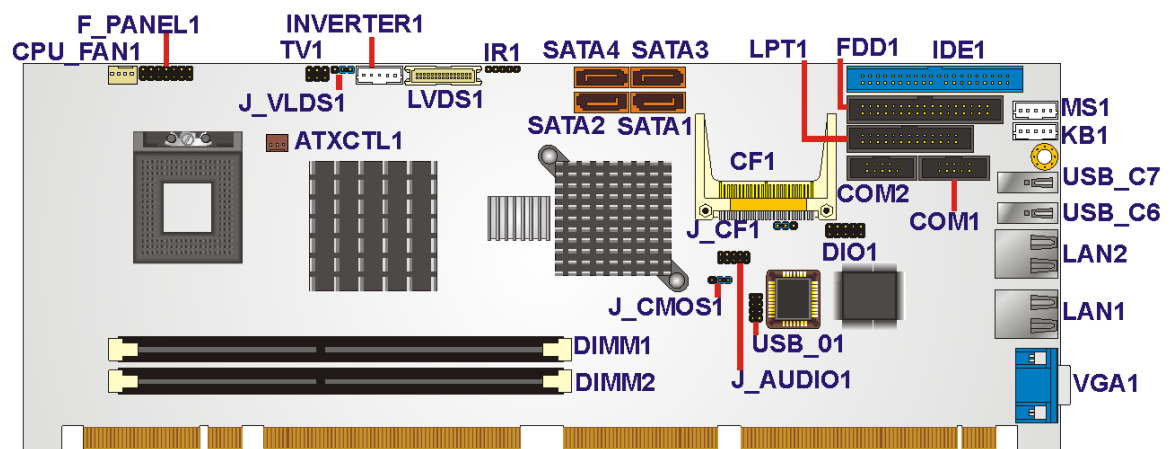


Figure 4-1: Connector and Jumper Locations

4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the PCIE-9452. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
+12V ATX power supply connector	4-pin ATX connector	CN1 and CN2
+5V power connector	2-pin ATX connector	CN3
ATX enable connector	3-pin wafer	ATXCTL1
Audio connector	14-pin header	J_AUDIO1
Compact Flash (CF) connector	50-pin header	CF1
Digital I/O connector	10-pin header	DIO1
Fan connector	3-pin wafer	CPU_FAN1
Front panel connector	8-pin header	F_PANEL1
IDE Interface connector	44-pin header	IDE1
Infrared connector	5-pin header	IR1
Inverter power connector	5-pin header	INVERTER1
Keyboard and mouse connector	6-pin wafer	KB1
LVDS connector	30-pin crimp	LVDS1
Parallel port connector	26-pin header	LPT1
Serial ATA (SATA) connector	7-pin SATA connector	SATA1
Serial ATA (SATA) connector	7-pin SATA connector	SATA2
Serial ATA (SATA) connector	7-pin SATA connector	SATA3
Serial ATA (SATA) connector	7-pin SATA connector	SATA4

Connector	Type	Label
Serial port connector (COM 1)	10-pin header	COM3
Serial port connector (COM 2)	10-pin header	COM4
TV out connector	6-pin header	TV1
USB connector	8-pin header	USB01

Table 4-1: Peripheral Interface Connectors

4.1.3 External Interface Panel Connectors

Table 4-2 lists the rear panel connectors on the PCIE-9452. Detailed descriptions of these connectors can be found in **Section 4.3** on **page 70**

Connector	Type	Label
Ethernet connector	RJ-45	LAN1
Ethernet connector	RJ-45	LAN2
USB port	USB port	USB_C45
VGA port connector	Female DB-15	VGA1

Table 4-2: Rear Panel Connectors

4.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the PCIE-9452.

4.2.1 ATX Power Supply Enable Connector

CN Label: ATXCTL1

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CN Type: 3-pin wafer (1x3)

CN Location: See Figure 4-2

CN Pinouts: See Table 4-3

The ATX power supply enable connector enables the PCIE-9452 to be connected to an ATX power supply. In default mode, the PCIE-9452 can only use an AT power supply. To enable an ATX power supply the AT Power Select jumper must also be configured. Please refer to Chapter 3 for more details.

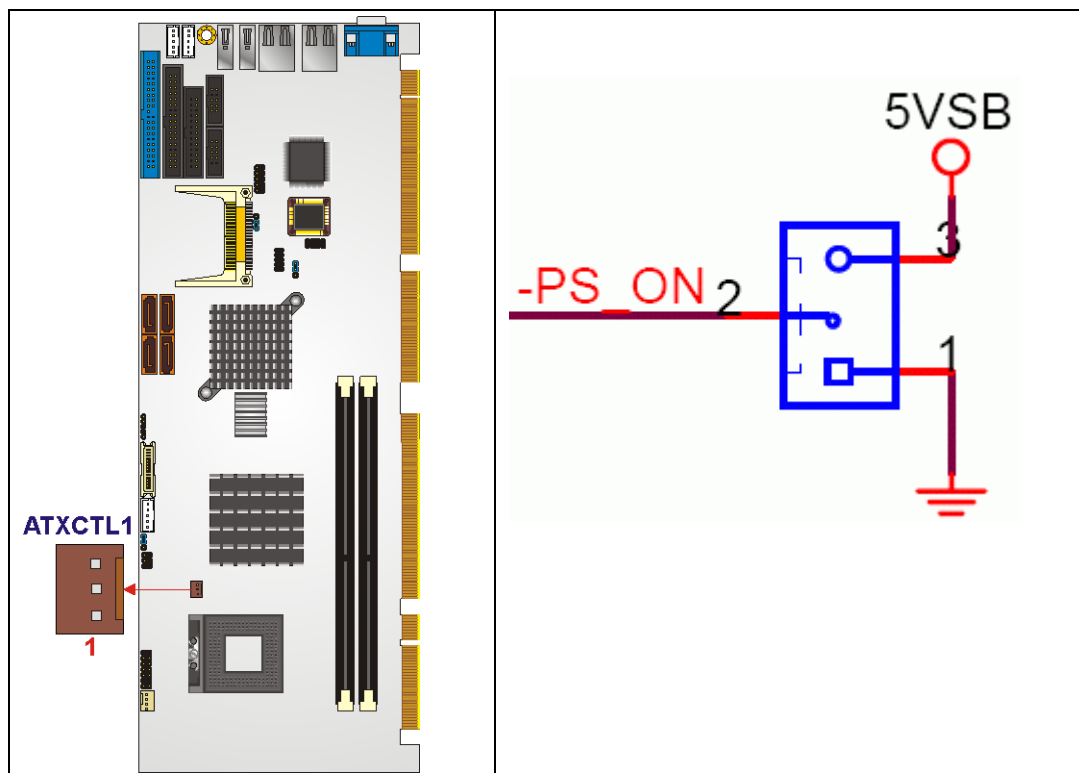


Figure 4-2: ATX Power Supply Enable Connector Location

PIN NO.	DESCRIPTION
1	GND
2	PS-ON

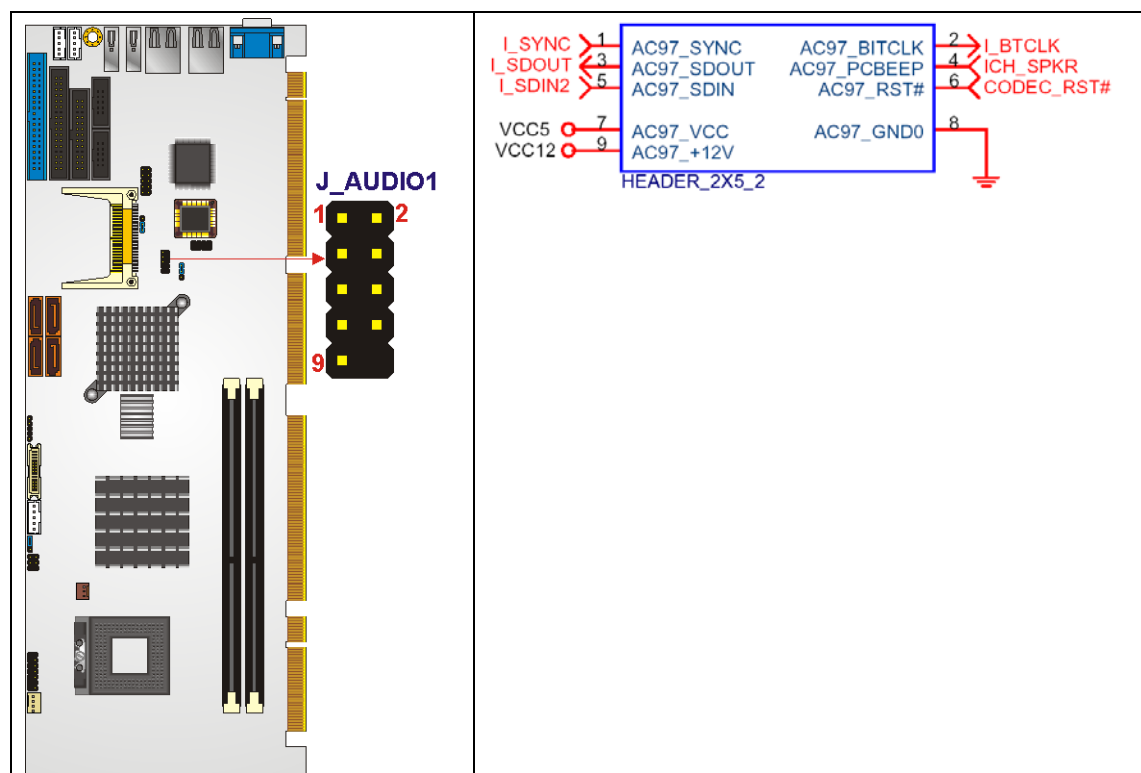
3	+5V Standby
---	-------------

Table 4-3: ATX Power Supply Enable Connector Pinouts

4.2.2 Audio Connector (9-pin)

CN Label:	J_AUDIO1
CN Type:	9-pin header
CN Location:	See Figure 4-3
CN Pinouts:	See Table 4-4

An optional module can be connected to the 10-pin audio connector to provide the system with a high quality AC'97 or Azalia compatible codec that provides a complete integrated audio solution.



PCIE-9452 PICMG 1.3 CPU Card

Figure 4-3: Audio Connector Pinouts (10-pin)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	AC97_SYNC	2	AC97_BITCLK
3	AC97_SDOUT	4	AC97_PCBEEP
5	AC97_SDIN	6	AC97_RST#
7	AC97_VCC	8	AC97_GND
9	AC97_12V		

Table 4-4: Audio Connector Pinouts (10-pin)

4.2.3 Backlight Inverter Connector

CN Label:	INVERTER1
CN Type:	5-pin wafer (1x5)
CN Location:	See Figure 4-4
CN Pinouts:	See Table 4-5

The backlight inverter connector provides the backlight on the LCD display connected to the PCIE-9452 with +12V of power.

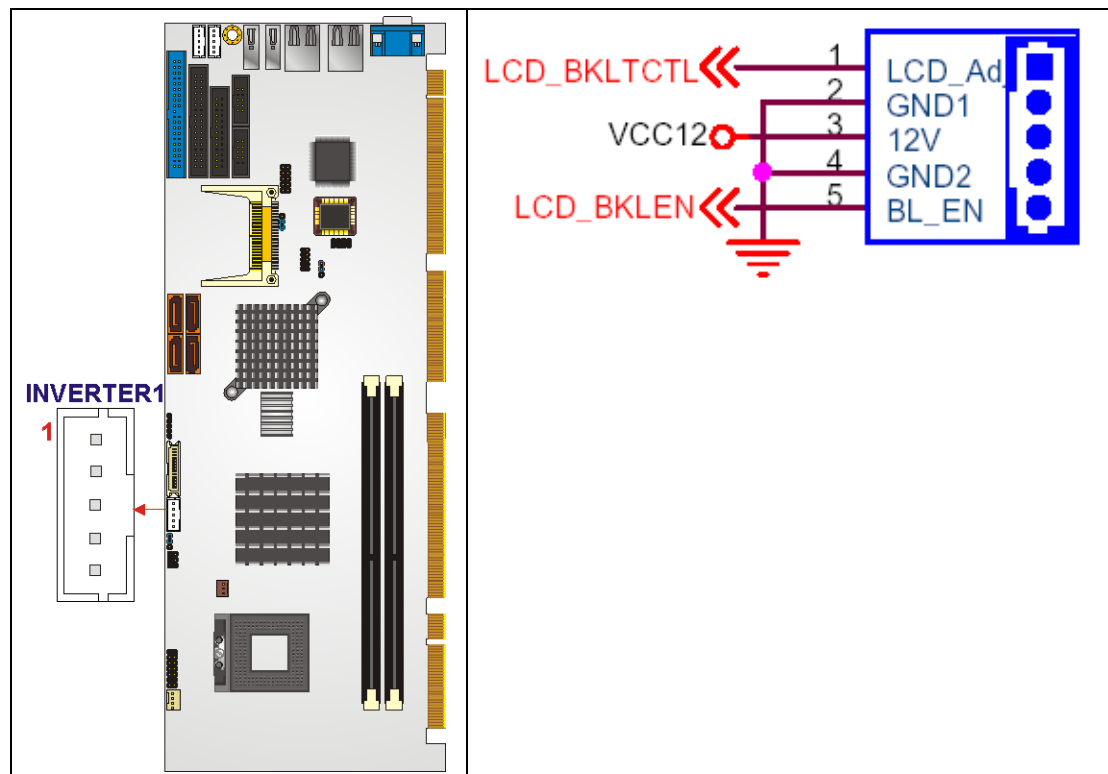


Figure 4-4: Panel Backlight Connector Pinout Locations

PCIE-9452 PICMG 1.3 CPU Card

PIN NO.	DESCRIPTION
1	BRIGHTNESS
2	GROUND
3	+12V
4	GROUND
5	BACKLIGHT ENABLE

Table 4-5: Panel Backlight Connector Pinouts

4.2.4 Compact Flash Socket

- CN Label:** CF1 (solder side)
- CN Type:** 50-pin header (2x25)
- CN Location:** See Figure 4-5
- CN Pinouts:** See Table 4-6

A CF Type I or Type II memory card is inserted to the CF socket on the solder side of the PCIE-9452.

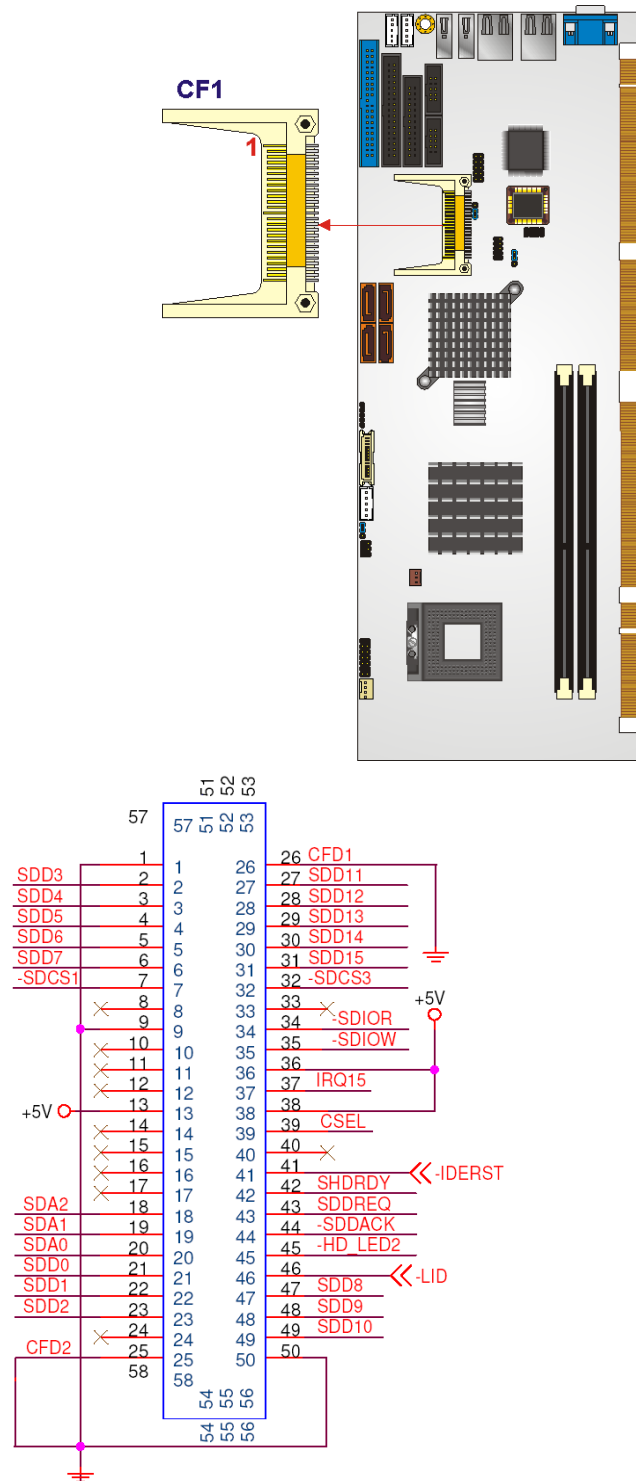


Figure 4-5: CF Card Socket Location

PCIE-9452 PICMG 1.3 CPU Card

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	VCC-IN CHECK1
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	HDC_CS0#	32	HDC_CS1
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	VCC_COM
12	N/C	37	IRQ15
13	VCC_COM	38	VCC_COM
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	HDD_RESET
17	N/C	42	IORDY
18	SA2	43	SDREQ
19	SA1	44	SDACK#
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	66DET
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK2	50	GROUND

Table 4-6: CF Card Socket Pinouts

4.2.5 Digital Input/Output (DIO) Connector

- CN Label:** DIO1
- CN Type:** 10-pin header (2x5)
- CN Location:** See Figure 4-6
- CN Pinouts:** See Table 4-7

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.

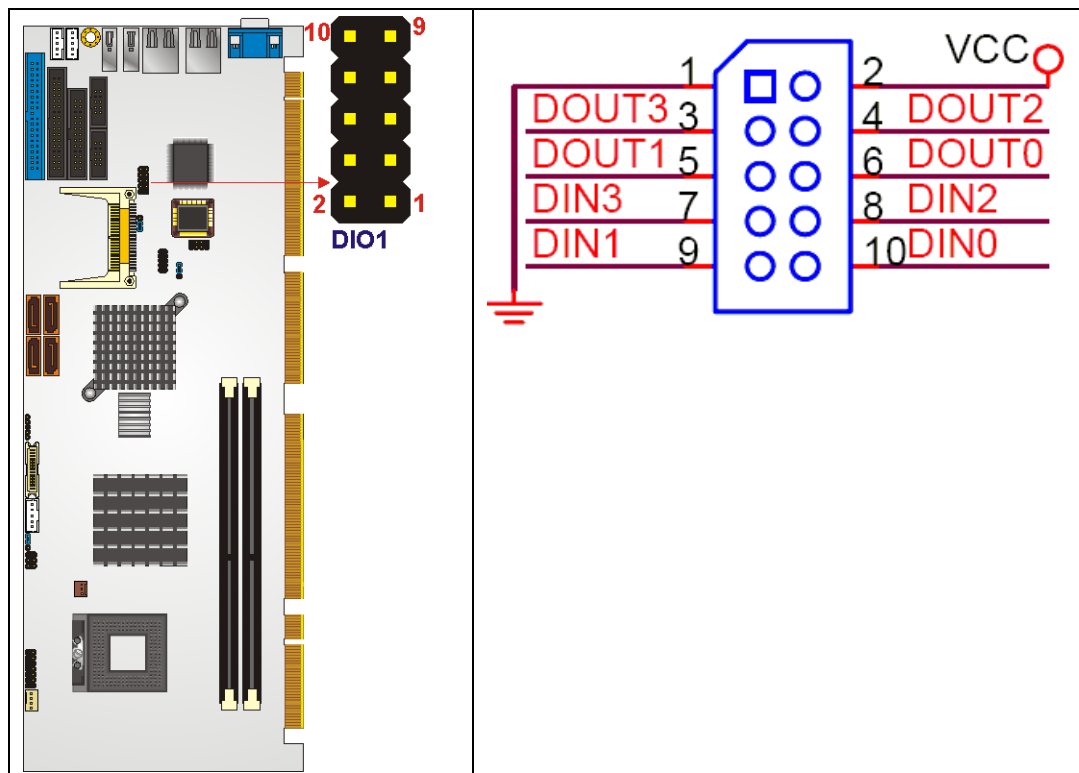


Figure 4-6: DIO Connector Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0

PCIE-9452 PICMG 1.3 CPU Card

7	Input 3	8	Input 2
9	Input 1	10	Input 0

Table 4-7: DIO Connector Connector Pinouts

4.2.6 Fan Connector (+12V)

CN Label:	CPU_FAN1
CN Type:	3-pin header
CN Location:	See Figure 4-7
CN Pinouts:	See Table 4-8

The cooling fan connector provides a 12V, 500mA current to a system cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

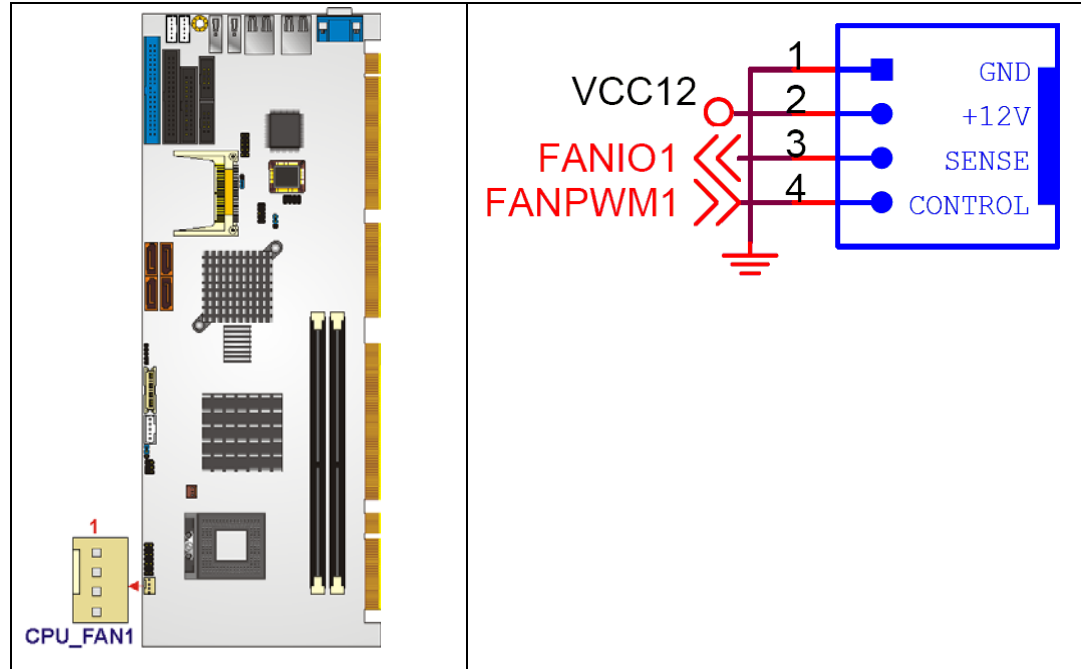


Figure 4-7: +12V Fan Connector Location

PIN NO.	DESCRIPTION
1	Ground
2	+12V
3	Rotation Signal
4	Control

Table 4-8: +12V Fan Connector Pinouts

4.2.7 Floppy Disk Connector (34-pin)

CN Label: FDD1

CN Type: 34-pin header (2x17)

CN Location: See Figure 4-8

CN Pinouts: See Table 4-9

The floppy disk connector is connected to a floppy disk drive.

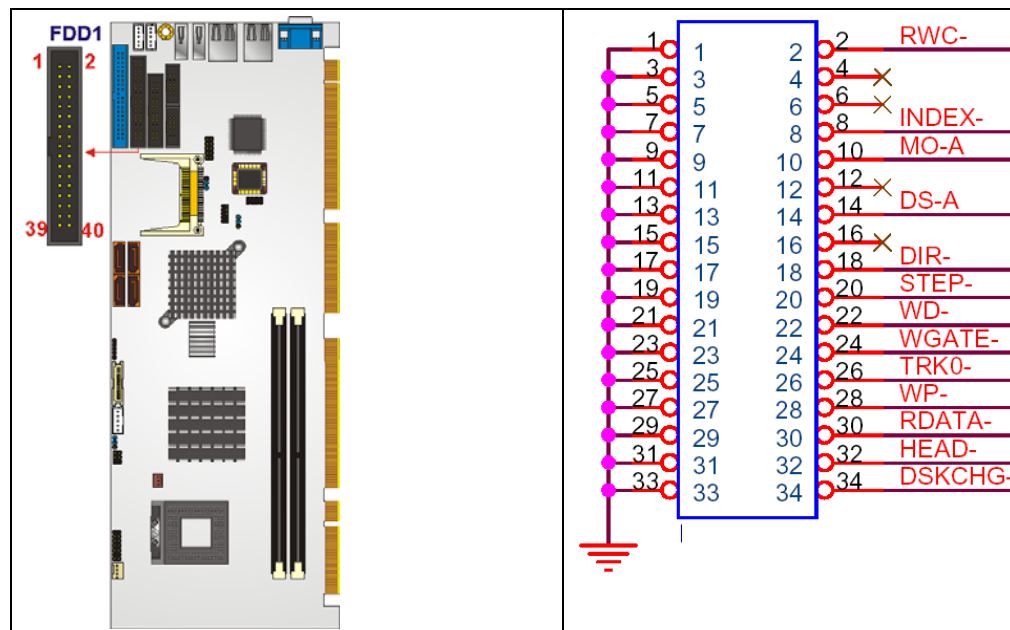


Figure 4-8: 34-pin FDD Connector Location

PCIE-9452 PICMG 1.3 CPU Card

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	REDUCE WRITE
3	GND	4	N/C
5	N/C	6	N/C
7	GND	8	INDEX#
9	GND	10	MOTOR ENABLE A#
11	GND	12	DRIVE SELECT B#
13	GND	14	DRIVE SELECT A#
15	GND	16	MOTOR ENABLE B#
17	GND	18	DIRECTION#
19	GND	20	STEP#
21	GND	22	WRITE DATA#
23	GND	24	WRITE GATE#
25	GND	26	TRACK 0#
27	GND	28	WRITE PROTECT#
29	GND	30	READ DATA#
31	GND	32	SIDE 1 SELECT#
33	GND	34	DISK CHANGE#

Table 4-9: 34-pin FDD Connector Pinouts

4.2.8 Front Panel Connector (14-pin)

CN Label: F_PANEL1

CN Type: 14-pin header (2x6)

CN Location: See Figure 4-9

CN Pinouts: See Table 4-10

The front panel connector connects to external switches and indicators to monitor and controls the motherboard. These indicators and switches include:

- Power button
- Reset button

- Power LED
- HDD LED

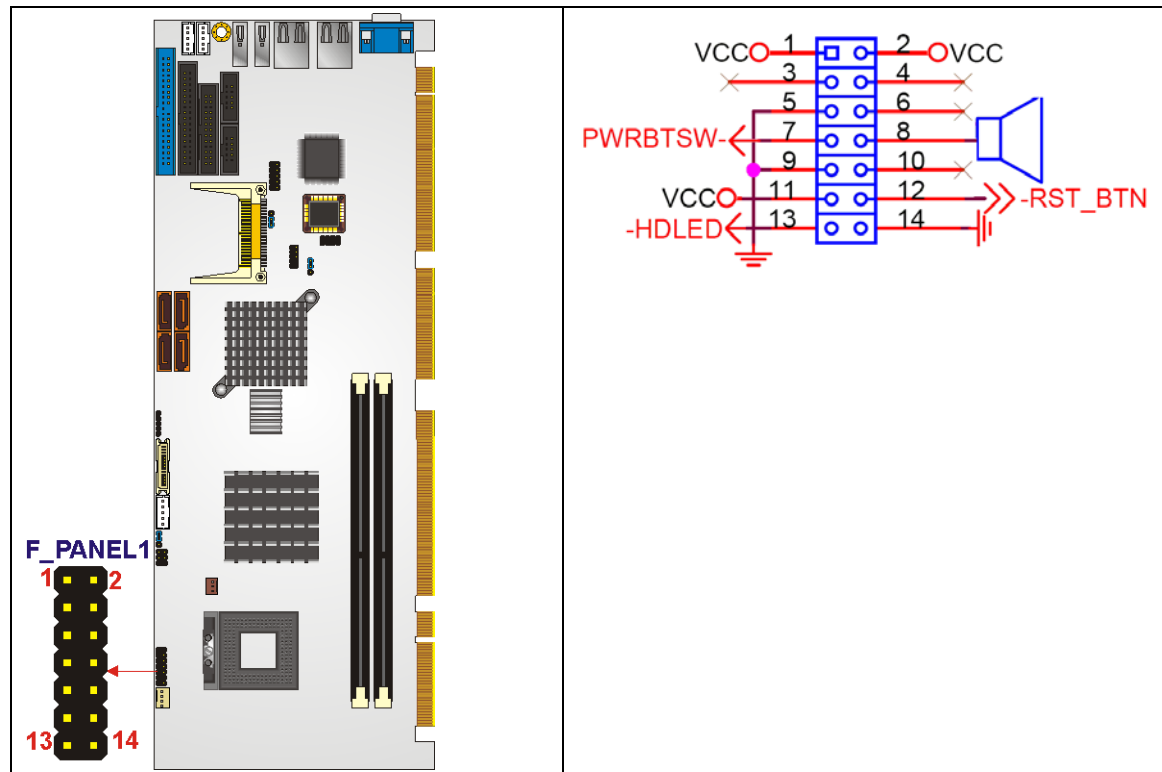


Figure 4-9: Front Panel Connector Pinout Locations

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	+5V	Speaker	2	+5V
	3	N/C		4	N/C
	5	Ground		6	N/C
Power Button	7	PWRBTN-		8	Speaker
	9	GND	Reset	10	N/C
HDD LED	11	+5V		12	Reset-
	13	HDD LED-		14	GND

Table 4-10: Front Panel Connector Pinouts

PCIE-9452 PICMG 1.3 CPU Card**4.2.9 IDE Connector(40-pin)**

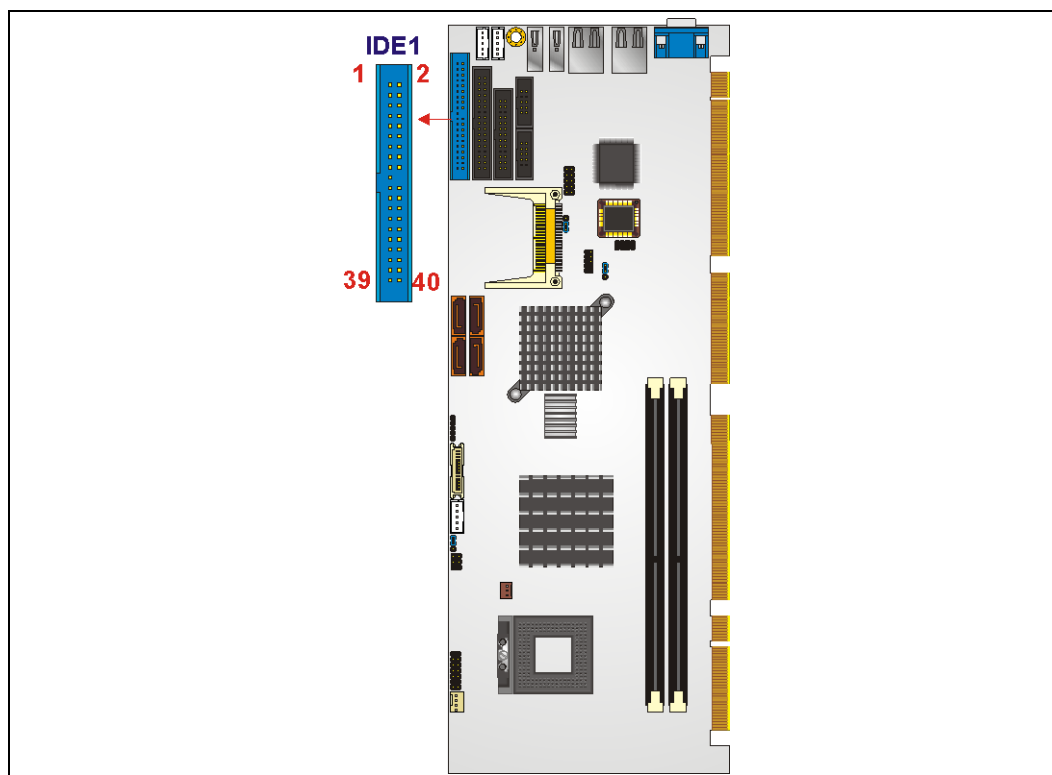
CN Label: IDE1

CN Type: 40-pin header (2x20)

CN Location: See Figure 4-10

CN Pinouts: See Table 4-11

One 40-pin IDE device connector on the PCIE-9452 supports connectivity to two hard disk drives.



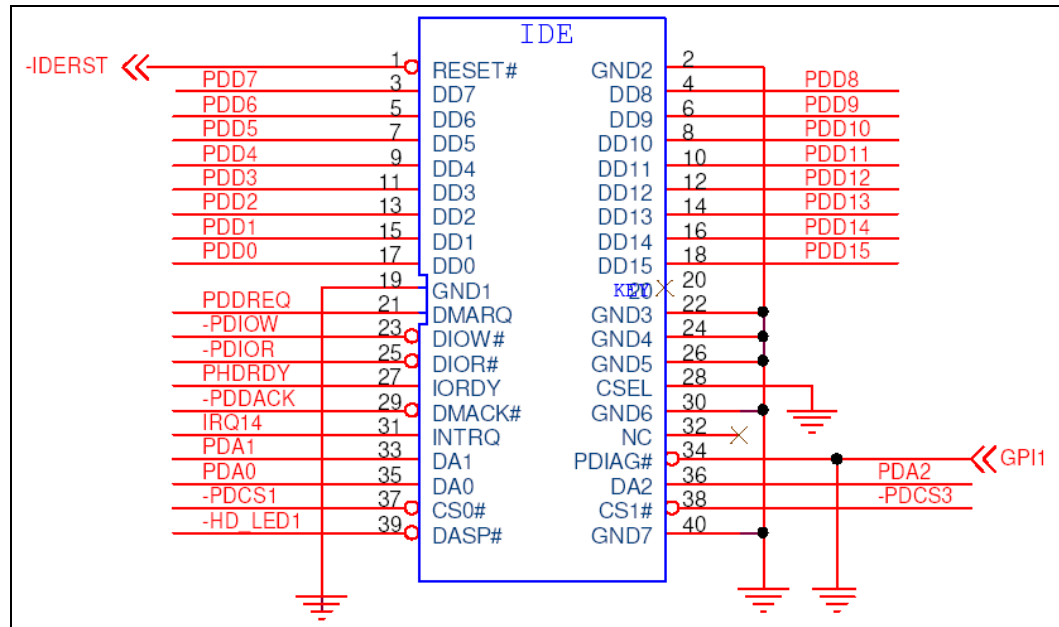


Figure 4-10: Secondary IDE Device Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	GROUND
29	IDE DACK	30	GROUND—DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	N/C

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35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

Table 4-11: Secondary IDE Connector Pinouts

4.2.10 Infrared Interface Connector (5-pin)

CN Label:	IR1
CN Type:	5-pin header (1x5)
CN Location:	See Figure 4-11
CN Pinouts:	See Table 4-12

The infrared interface connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.

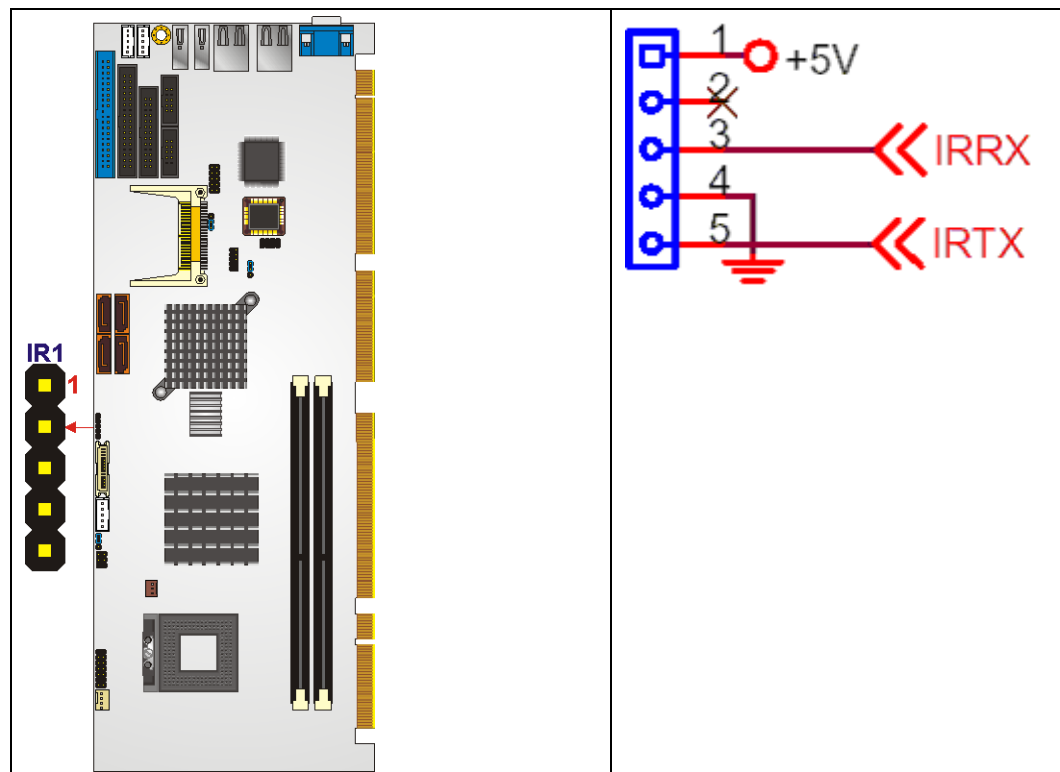


Figure 4-11: Infrared Connector Pinout Locations

PIN NO.	DESCRIPTION
1	VCC
2	NC
3	IR-RX
4	GND
5	IR-TX

Table 4-12: Infrared Connector Pinouts

4.2.11 Keyboard Connector

- CN Label:** KB1
- CN Type:** 5-pin header (1x5)
- CN Location:** See Figure 4-12
- CN Pinouts:** See Table 4-13

The keyboard connector can be connected to a standard PS/2 cable to add keyboard functionality to the system.

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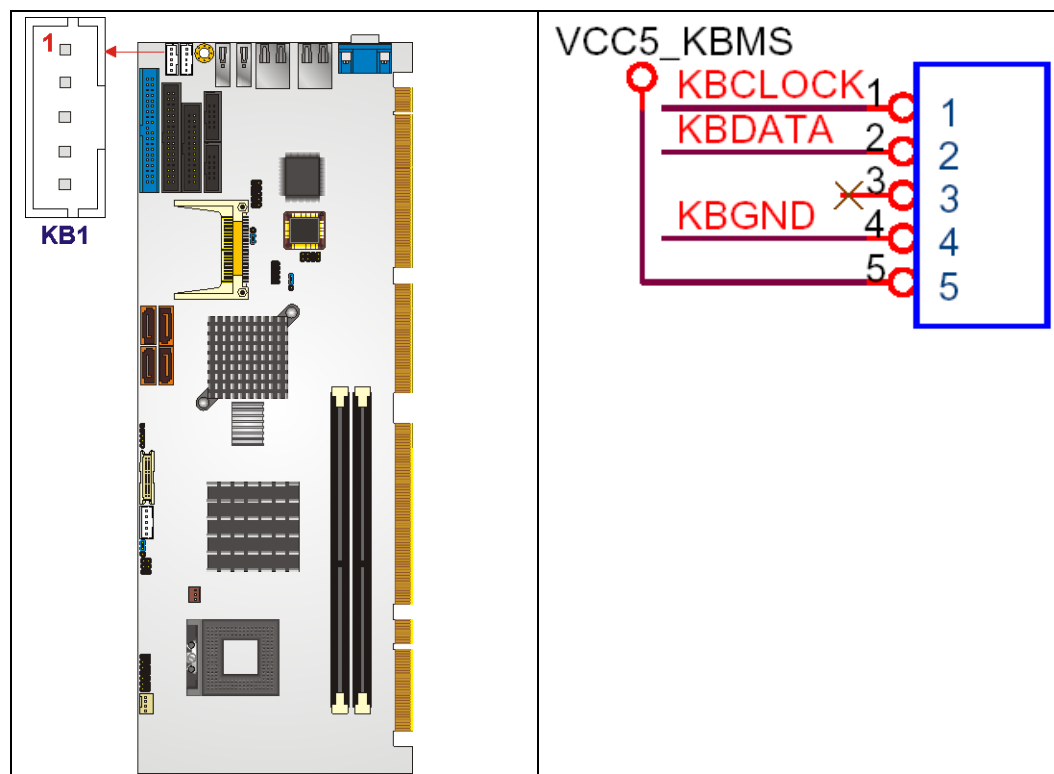


Figure 4-12: Keyboard Connector Location

PIN NO.	DESCRIPTION
1	KEYBOARD CLOCK
2	KEYBOARD DATA
3	N/C
4	GROUND
5	VCC

Table 4-13: Keyboard Connector Pinouts

4.2.12 LVDS LCD Connector

CN Label:	LVDS1
CN Type:	30-pin crimp (2x10)
CN Location:	See Figure 4-13
CN Pinouts:	See Table 4-14

The 30-pin LVDS LCD connector can be connected to single channel or dual channel, 18-bit or 36-bit LVDS panel.

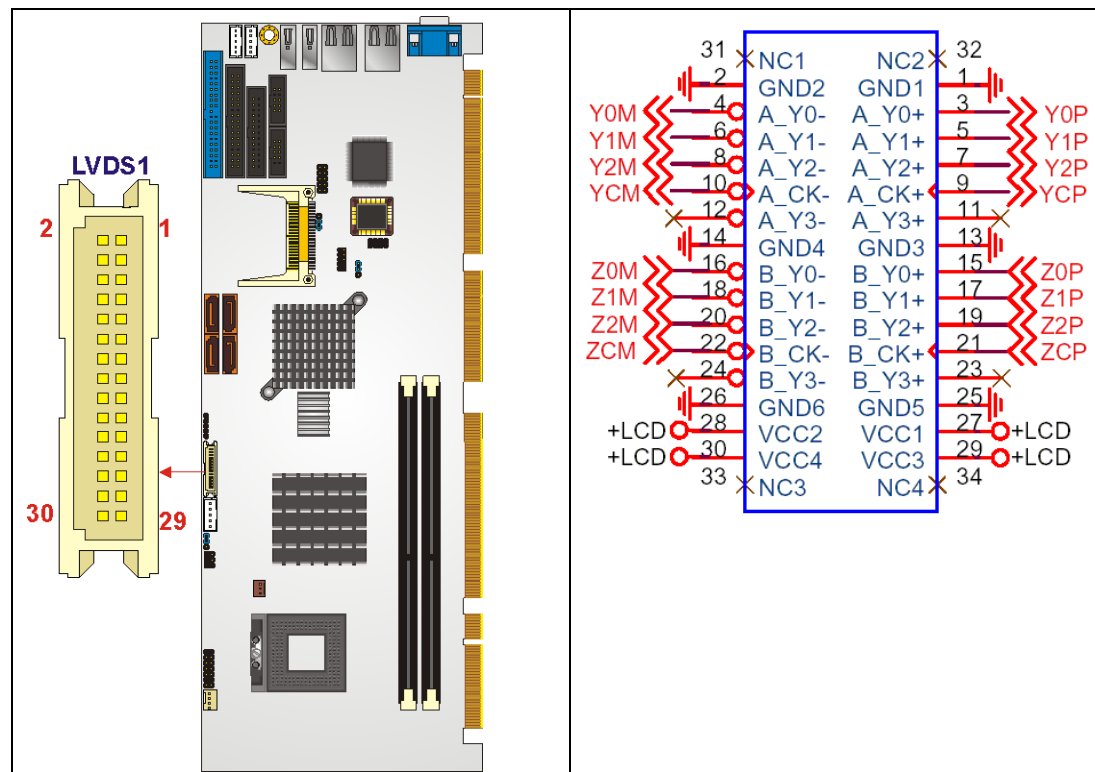


Figure 4-13: LVDS LCD Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	2	GROUND
3	LVDSA_Y0+	4	LVDSA_Y0-
5	LVDSA_Y1+	6	LVDSA_Y1-
7	LVDSA_Y2+	8	LVDSA_Y2-
9	LVDSA_CLK+	10	LVDSA_CLK-
11	LVDSA_Y3+	12	LVDSA_Y3-
13	GROUND	14	GROUND
15	LVDSB_Y0+	16	LVDSB_Y0-
17	LVDSB_Y1+	18	LVDSB_Y1-
19	LVDSB_Y2+	20	LVDSB_Y2-
21	LVDSB_CLK+	22	LVDSB_CLK-

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23	LVDSB_Y3+	24	LVDSB_Y3-
25	GROUND	26	GROUND
27	VCC_LVDS	28	VCC_LVDS
29	VCC_LVDS	30	VCC_LVDS

Table 4-14: LVDS LCD Port Connector Pinouts

4.2.13 Mouse Connector

- CN Label:** MS1
- CN Type:** 5-pin header (1x5)
- CN Location:** See Figure 4-12
- CN Pinouts:** See Table 4-13

The mouse connector can be connected to a standard PS/2 cable to add keyboard and mouse functionality to the system.

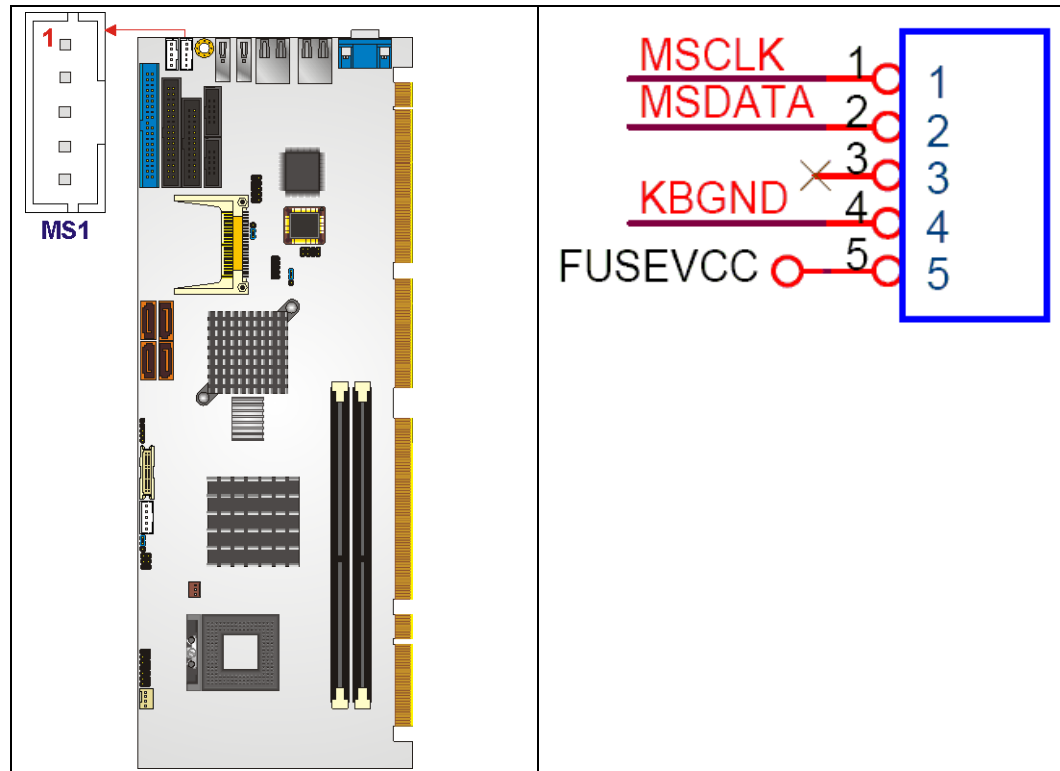


Figure 4-14: Mouse Connector Location

PIN NO.	DESCRIPTION
1	MOUSE CLOCK
2	MOUSE DATA
3	N/C
4	GROUND
5	VCC

Table 4-15: Mouse Connector Pinouts

4.2.14 Parallel Port Connector

CN Label:	LPT1
CN Type:	26-pin box header
CN Location:	See Figure 4-15
CN Pinouts:	See Table 4-16

PCIE-9452 PICMG 1.3 CPU Card

The 26-pin parallel port connector connects to a parallel port connector interface or some other parallel port device such as a printer.

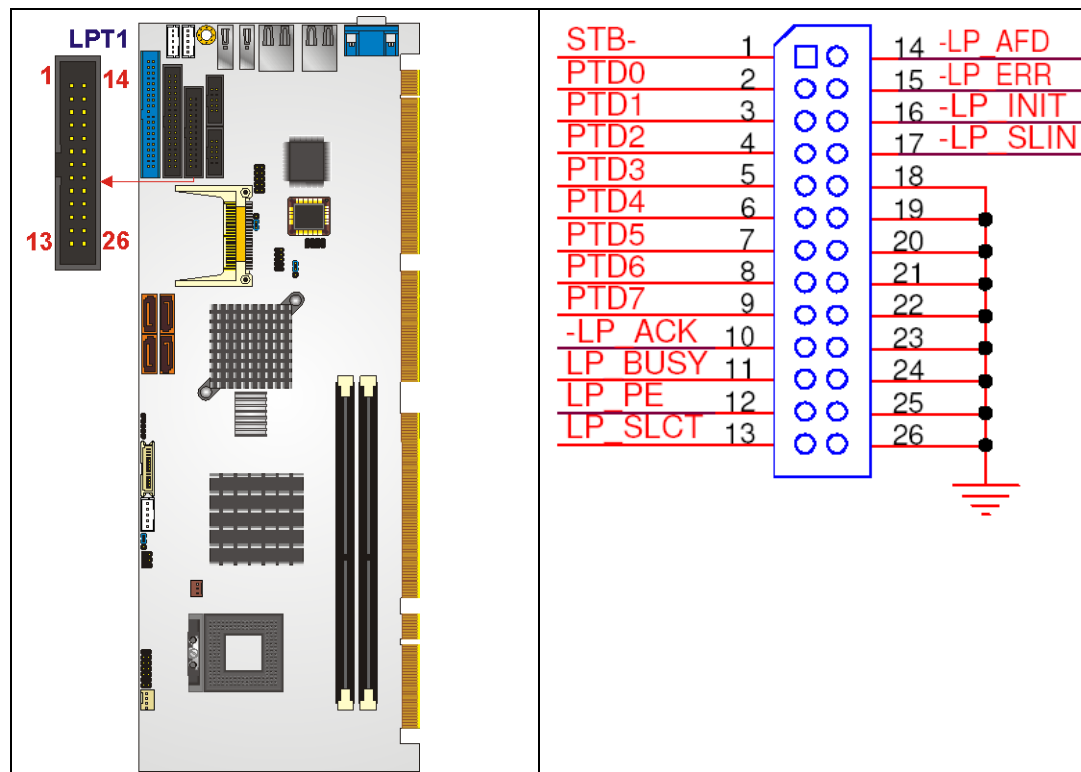


Figure 4-15: Parallel Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STROBE#	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GROUND
19	GROUND	20	GROUND
21	GROUND	22	GROUND

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
23	GROUND	24	GROUND
25	GROUND	26	NC

Table 4-16: Parallel Port Connector Pinouts

4.2.15 SATA Drive Connectors

CN Label: SATA1, SATA2, SATA3 and SATA4

CN Type: 7-pin SATA drive connectors

CN Location: See Figure 4-16

CN Pinouts: See Table 4-17

The four SATA drive connectors are each connected to a second generation SATA drive. Second generation SATA drives transfer data at speeds as high as 300Mb/s. The SATA drives can be configured in a RAID configuration.

PCIE-9452 PICMG 1.3 CPU Card

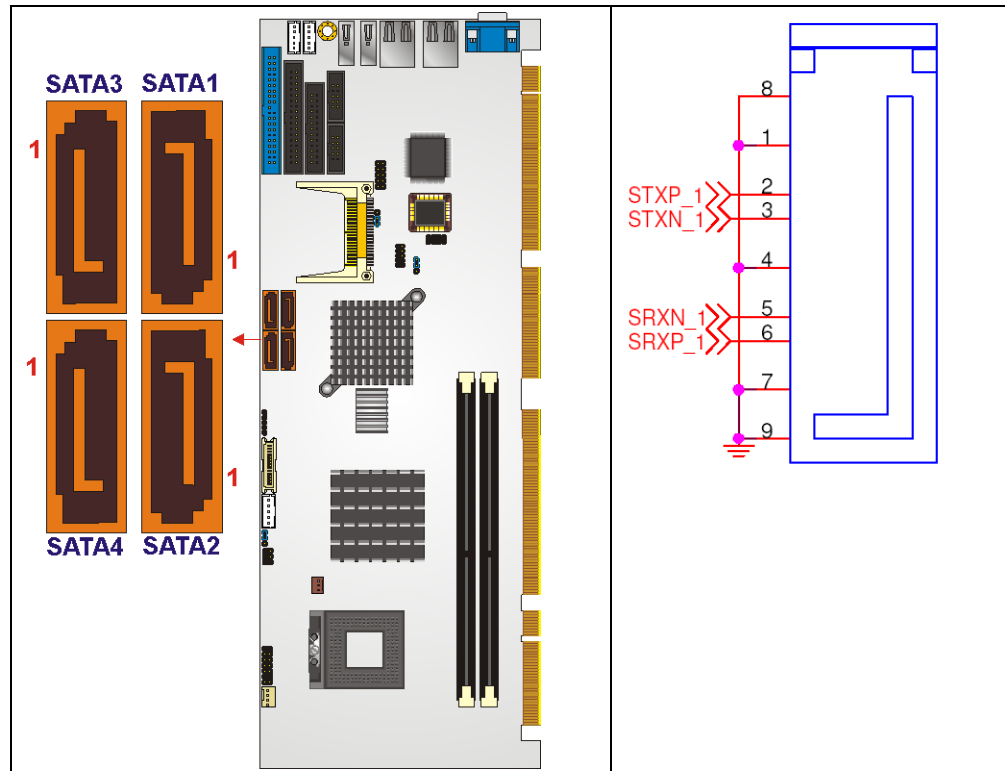


Figure 4-16: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 4-17: SATA Drive Connector Pinouts

4.2.16 Serial Port Connector (COM1 and COM2)

CN Label:	COM1 and COM2
CN Type:	10-pin header (2x5)
CN Location:	See Figure 4-17
CN Pinouts:	See Table 4-18

The 10-pin serial port connector provides a second RS-232 serial communications channel. The serial port connectors can be connected to external RS-232 serial port devices.

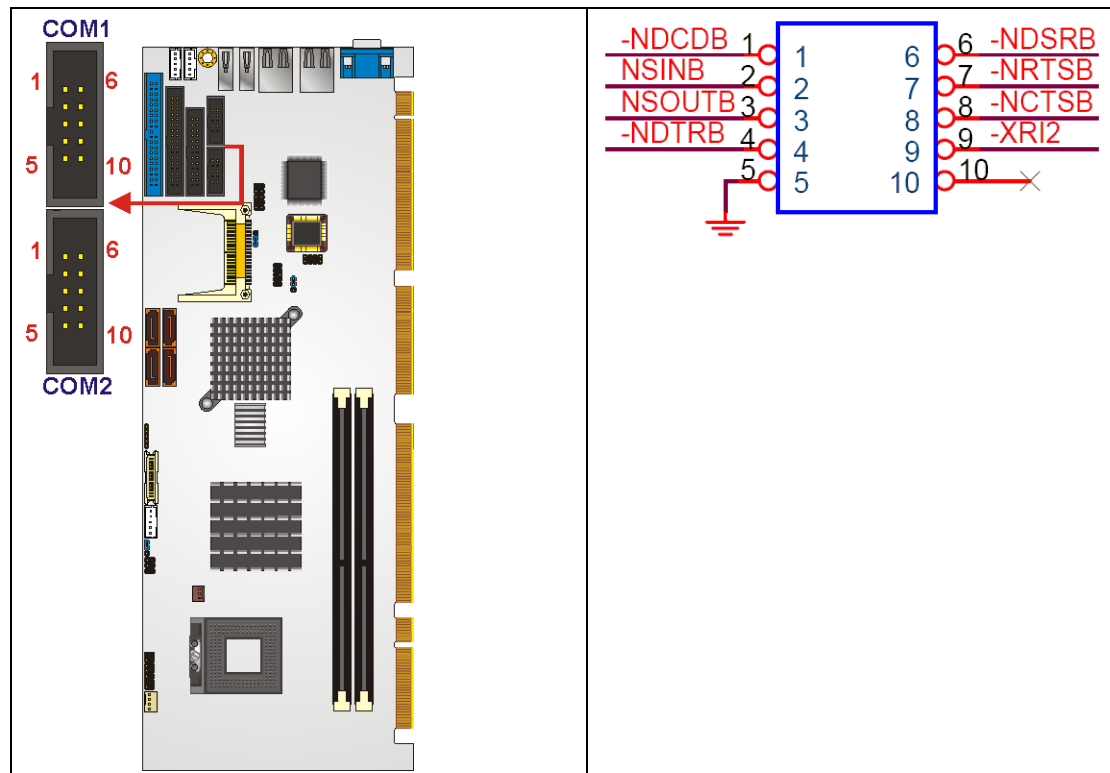


Figure 4-17: COM1 and COM2 Connector Pinout Locations

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PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Data Carrier Detect (DCD)	2	Receive Data (RXD)
3	Transmit Data (TXD)	4	Data Terminal Ready (DTR)
5	Ground (GND)	6	Data Set to Ready (DSR)
7	Request to Send (RTS)	8	Clear to Sent (CTS)
9	Ring Indicator (RI)	10	N/C

Table 4-18: COM1 and COM2

4.2.17 TV Out Connector

- CN Label:** TV1
- CN Type:** 6-pin header (2x3)
- CN Location:** See Figure 4-18
- CN Pinouts:** See Table 4-19

The 2x3 pin TV out connector connects to a TV output by using an S-Video or RCA connector. The TV out connector makes displaying media data on a television easier. HDTV resolutions up to 1080i / 1080P by component interface are also supported.

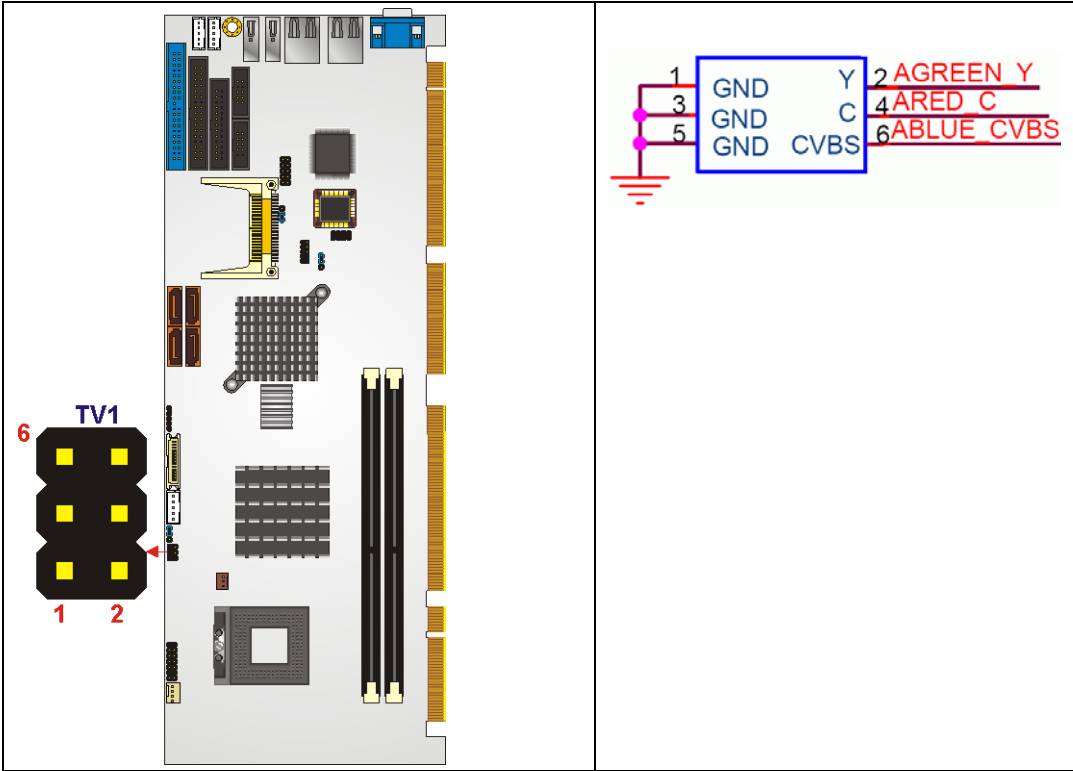


Figure 4-18: TV Connector Pinout Locations

S-Video Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	AGREEN_Y
3	GND	4	ARED_C
RCA Connector (only video signal)			
5	GND	6	ABLUE_CVBS

Table 4-19: TV Port Connector Pinouts

4.2.18 USB Connectors (Internal)

- CN Label: USB01
- CN Type: 8-pin header (2x4)
- CN Location: See Figure 4-19

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CN Pinouts: See Table 4-20

The 2x4 USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices.. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

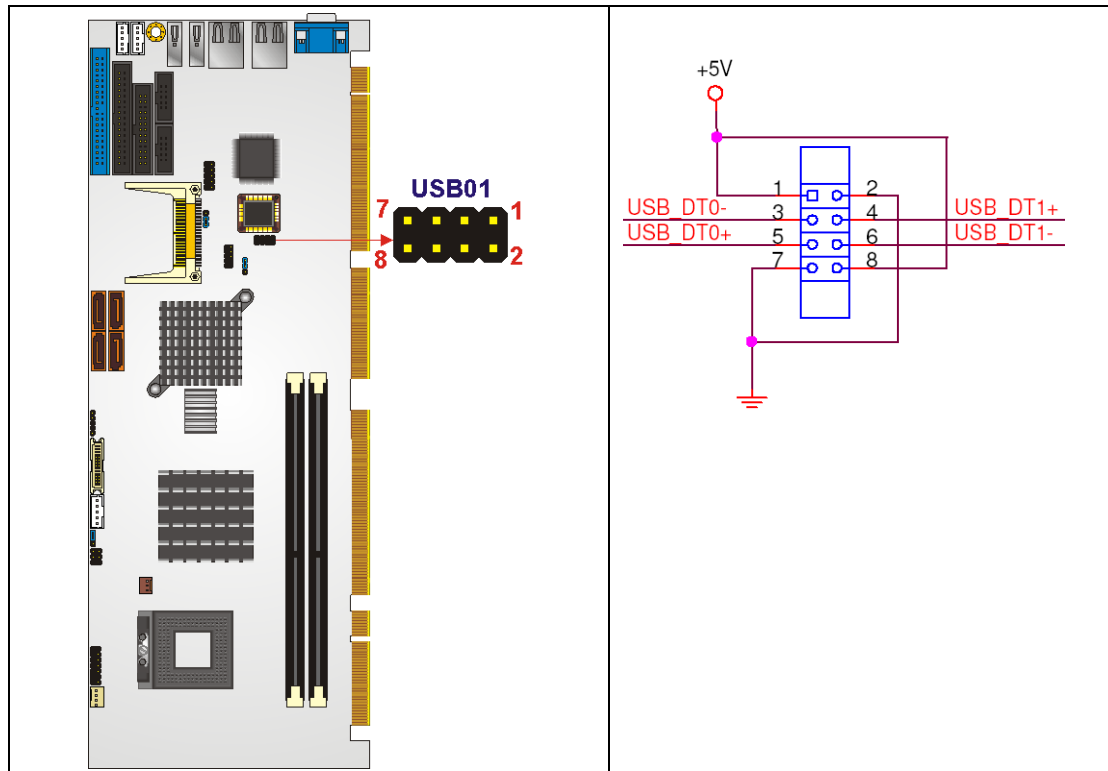


Figure 4-19: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATAN-	4	DATA1M-
5	DATAN+	6	DATAM+
7	GND	8	VCC

Table 4-20: USB Port Connector Pinouts

4.3 External Peripheral Interface Connector Panel

Figure 4-20 shows the PCIE-9452 rear panel. The PCIE-9452 rear panel consists of two RJ-45 Ethernet connectors, a PS/2 keyboard connector a USB port and a VGA connector. These connectors are accessible when the PCIE-9452 is installed in a chassis.

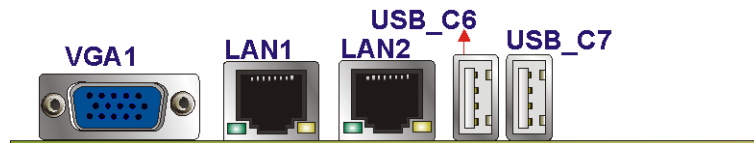


Figure 4-20: PCIE-9452 External Peripheral Interface Connector

4.3.1 LAN Connectors

CN Label: LAN1 and LAN2

CN Type: RJ-45

CN Location: See Figure 4-20

CN Pinouts: See Table 4-21

The PCIE-9452 is equipped with two built-in GbE Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TXA+	5	TXC-
2	TXA-	9	TXB-
3	TXB+	10	TXD+
4	TXC+	11	TXD-

Table 4-21: LAN Pinouts

PCIE-9452 PICMG 1.3 CPU Card

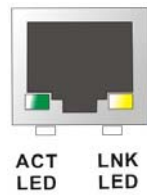


Figure 4-21: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 4-22**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
GREEN	Activity	YELLOW	Linked

Table 4-22: RJ-45 Ethernet Connector LEDs

4.3.2 USB Connector

CN Label: USB_C7 and USB_C6

CN Type: USB port

CN Location: See Figure 4-20

CN Pinouts: See Table 4-23

The PCIE-9452 has a one external USB 2.0 port. The port connects to both USB 2.0 and USB 1.1 devices.

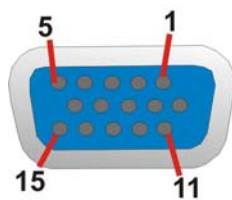
PIN NO.	DESCRIPTION
1	VCC
2	DATA-
3	DATA+
4	GND

Table 4-23: USB Port Pinouts

4.3.3 VGA Connector

- CN Label:** VGA1
- CN Type:** 15-pin Female
- CN Location:** See Figure 4-20
- CN Pinouts:** See Figure 4-22 and Table 4-24

The PCIE-9452 has a single 15-pin female connector for connectivity to standard display devices.


Figure 4-22: VGA Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	VCC / NC	10	GND
11	NC	12	DDC DAT

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PIN	DESCRIPTION	PIN	DESCRIPTION
13	HSYNC	14	VSYNC
15	DDCCLK		

Table 4-24: VGA Connector Pinouts

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Chapter

5

Installation

5.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the PCIE-9452 may result in permanent damage to the PCIE-9452 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PCIE-9452. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the PCIE-9452, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband:*** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding:*** - Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad:*** When configuring the PCIE-9452, place it on an anti-static pad. This reduces the possibility of ESD damaging the PCIE-9452.
- ***Only handle the edges of the PCB:-*** When handling the PCB, hold the PCB by the edges.

5.2 Installation Considerations



NOTE:

The following installation notices and installation considerations should be read and understood before the PCIE-9452 is installed. All installation notices pertaining to the installation of the PCIE-9452 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the PCIE-9452 and injury to the person installing the motherboard.

5.2.1 Installation Notices



WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the PCIE-9452, PCIE-9452 components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
 - The user manual provides a complete description of the PCIE-9452 installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
 - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the PCIE-9452 on an antistatic pad:
 - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the PCIE-9452 off:

- When working with the PCIE-9452, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the PCIE-9452 **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

5.2.2 Installation Checklist

The following checklist is provided to ensure the PCIE-9452 is properly installed.

- All the items in the packing list are present
- The CPU is installed
- The CPU cooling kit is properly installed
- A compatible memory module is properly inserted into the slot
- The CF Type I or CF Type II card is properly installed into the CF socket
- The jumpers have been properly configured
- The PCIE-9452 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
 - IDE device
 - SATA drives
 - Keyboard and mouse cable
 - Audio kit
 - Power supply
 - USB cable
 - Serial port cable
 - Parallel port cable
- The following external peripheral devices are properly connected to the chassis:
 - VGA screen

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- USB device
- LAN connection

5.3 CPU, CPU Cooling Kit and DIMM Installation



WARNING:

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU, PCIE-9452 and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the PCIE-9452. If one of these component is not installed the PCIE-9452 cannot run.

5.3.1 Socket M CPU Installation



WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

To install a Socket M CPU onto the PCIE-9452, follow the steps below:

**WARNING:**

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: Unlock the CPU retention screw. When shipped, the retention screw of the CPU socket should be in the unlocked position. If it is not in the unlocked position, use a screwdriver to unlock the screw. See **Figure 5-1**.

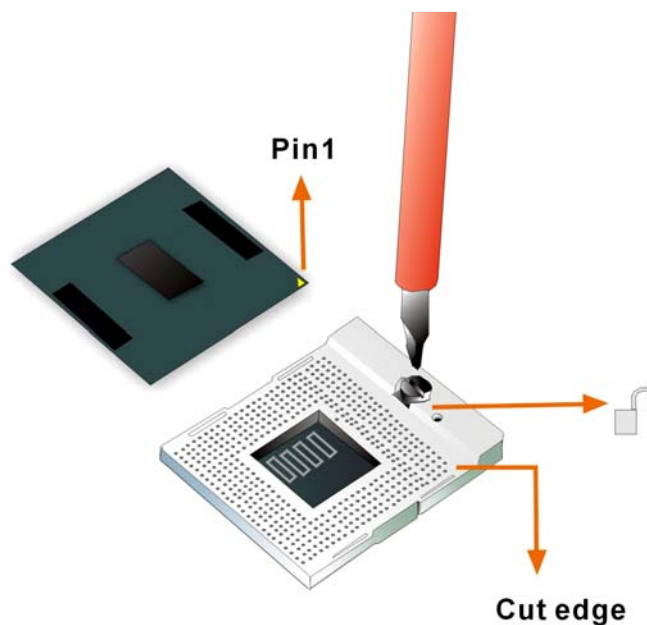


Figure 5-1: Make sure the CPU socket retention screw is unlocked

- Step 2: Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.
- Step 3: Correctly Orientate the CPU.** Make sure the IHS (integrated heat sink) side is facing upwards.
- Step 4: Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket. See **Figure 5-1**.

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Step 5: Align the CPU pins. Carefully align the CPU pins with the holes in the CPU socket.

Step 6: Insert the CPU. Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly.

Step 7: Lock the retention screw. Rotate the retention screw into the locked position. See Figure 5-2.

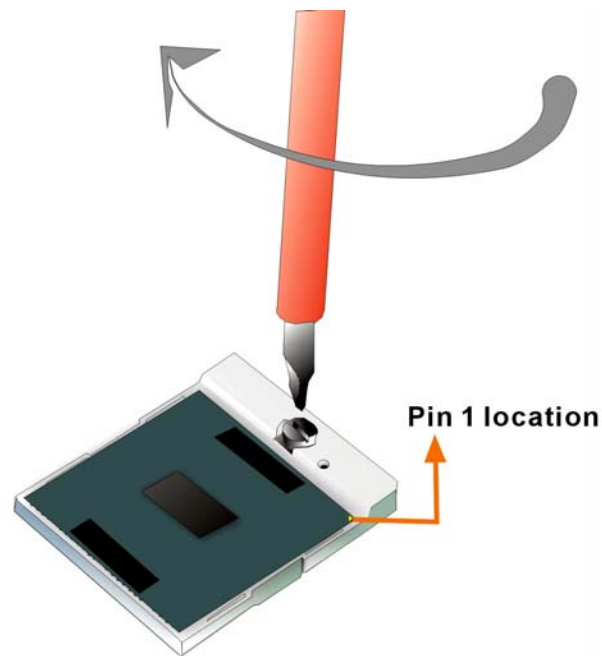


Figure 5-2: Lock the CPU Socket Retention Screw

5.3.2 Cooling Kit CF-479B-RS Installation



Figure 5-3: IEI CF-479B-RS Cooling Kit

An IEI Socket M CPU cooling kit can be purchased separately. The cooling kit comprises a CPU heat sink and a cooling fan.



WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the [Fan model#] heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the CF-479B-RS cooling kit, please follow the steps below.

- Step 1:** Place the cooling kit onto the CPU. Make sure the CPU cooling fan cable can be properly routed when the cooling kit is installed.
- Step 2:** Properly align the cooling kit. Make sure its four spring screw fasteners can pass through the pre-drilled holes on the PCB.
- Step 3:** Secure the cooling kit. From the solder side of the PCB, align the support bracket to the screw threads on heat sink that were inserted through the PCB holes. (See **Figure 5-4**)

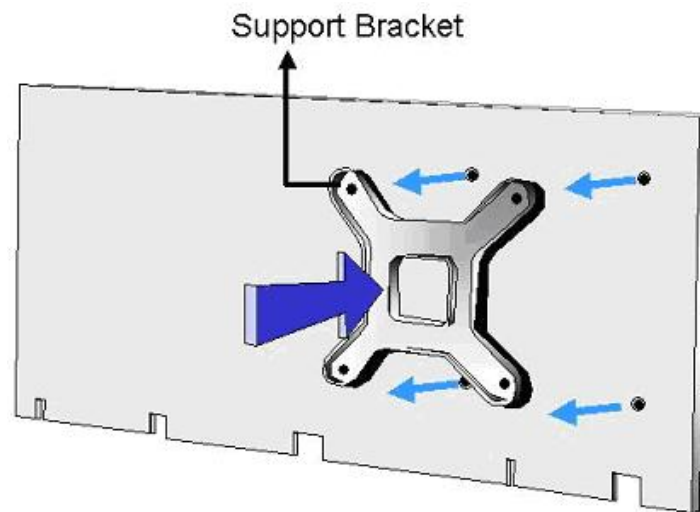


Figure 5-4: Cooling Kit Support Bracket

Step 4: Tighten the screws. Use a screwdriver to tighten the four screws. Tighten each nut a few turns at a time and do not over-tighten the screws.

Step 5: Connect the fan cable. Connect the cooling kit fan cable to the fan connector on the motherboard. Carefully route the cable and avoid heat generating chips and fan blades. See **Figure 5-5**.

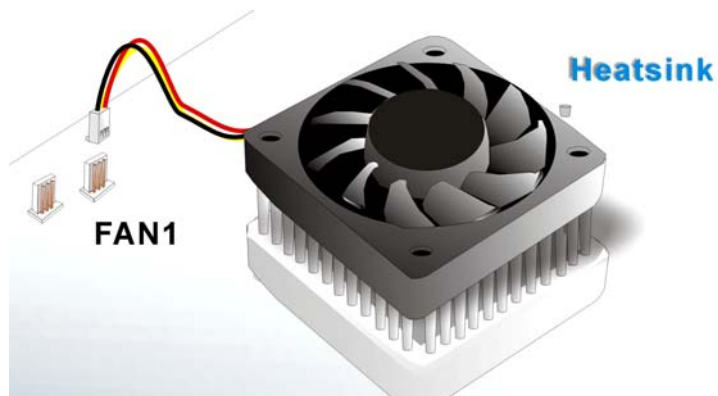


Figure 5-5: Connect the cooling fan cable

5.3.3 DIMM Installation

**WARNING:**

Using incorrectly specified DIMM may cause permanently damage the PCIE-9452. Please make sure the purchased DIMM complies with the memory specifications of the PCIE-9452. DIMM specifications compliant with the PCIE-9452 are listed in **Chapter 2**.

To install a DIMM into a DIMM socket, please follow the steps below and refer to **Figure 5-6**.

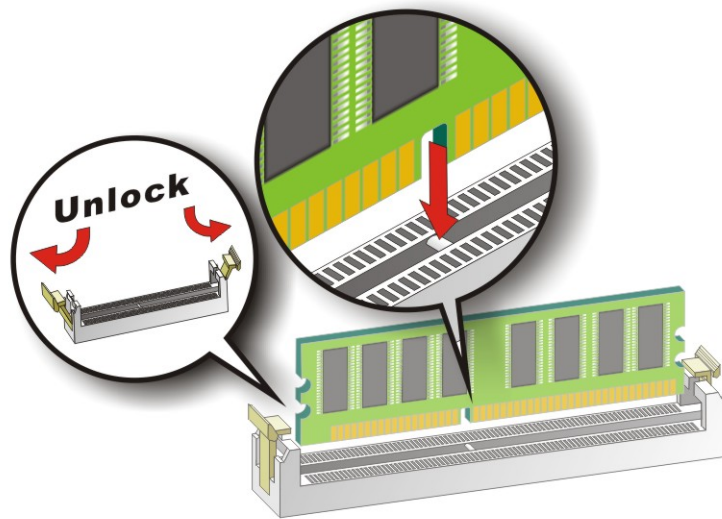


Figure 5-6: Installing a DIMM

- Step 1: Open the DIMM socket handles.** The DIMM socket has two handles that secure the DIMM into the socket. Before the DIMM can be inserted into the socket, the handles must be opened. See **Figure 5-6**.
- Step 2: Align the DIMM with the socket.** The DIMM must be oriented in such a way that the notch in the middle of the DIMM must be aligned with the plastic bridge

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in the socket. See **Figure 5-6**.

Step 3: Insert the DIMM. Once properly aligned, the DIMM can be inserted into the socket. As the DIMM is inserted, the white handles on the side of the socket will close automatically and secure the DIMM to the socket. See **Figure 5-6**.

Step 4: Removing a DIMM. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

5.3.4 CF Card Installation



NOTE:

The PCIE-9452 can support both CF Type I cards and CF Type II cards. For the complete specifications of the supported CF cards please refer to **Chapter 2**.

To install the a CF card (Type 1 or Type 2) onto the PCIE-9452, please follow the steps below:

Step 1: Locate the CF card socket. Place the PCIE-9452 on an anti-static pad with the solder side facing up. Locate the CF card.

Step 2: Align the CF card. Make sure the CF card is properly aligned with the CF socket.

Step 3: Insert the CF card. Gently insert the CF card into the socket making sure the socket pins are properly inserted into the socket. See **Figure 5-7**.

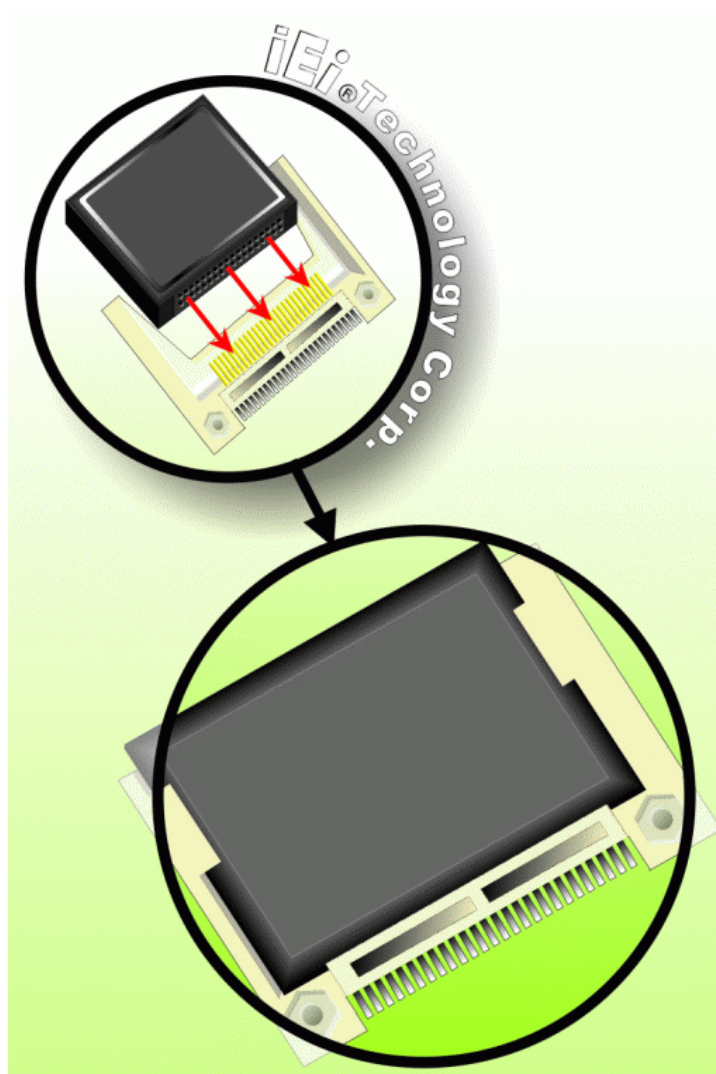


Figure 5-7: CF Card Installation

5.4 Jumper Settings



NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

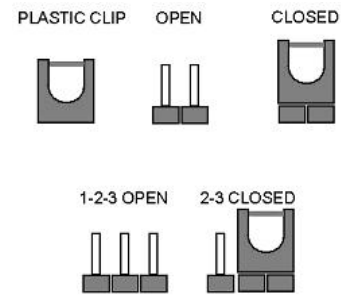


Figure 5-8: Jumper Locations

Before the PCIE-9452 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the PCIE-9452 are listed in **Table 5-1**.

Description	Label	Type
CF card setup	J_CF1	3-pin header
Clear CMOS	J_CMOS1	3-pin header
LVDS voltage selection	J_VLVDS1	3-pin header

Table 5-1: Jumpers

5.4.1 CF Card Setup

Jumper Label:	J_CF1
Jumper Type:	3-pin header
Jumper Settings:	See Table 5-2
Jumper Location:	See Figure 5-9

The CF Card Setup jumper sets the CF Type I card or CF Type II cards as either the slave device or the master device. CF Card Setup jumper settings are shown in **Table 5-2**.

AT Power Select	Description	
Short 1-2	Slave	Default
Short 2-3	Master	

Table 5-2: CF Card Setup Jumper Settings

The CF Card Setup jumper location is shown in **Figure 5-9**.

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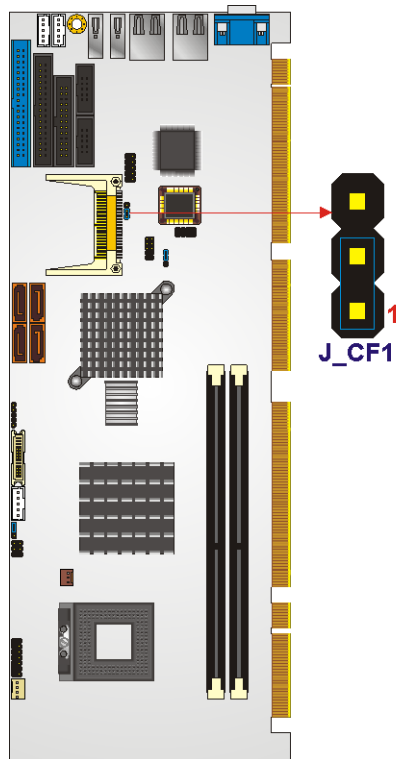


Figure 5-9: CF Card Setup Jumper Location

5.4.2 Clear CMOS Jumper

Jumper Label:	J_CMOS1
Jumper Type:	3-pin header
Jumper Settings:	See Table 5-3
Jumper Location:	See Figure 5-10

If the PCIE-9452 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 5-3**.

AT Power Select	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 - 3	Clear CMOS Setup	

Table 5-3: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 5-10** below.

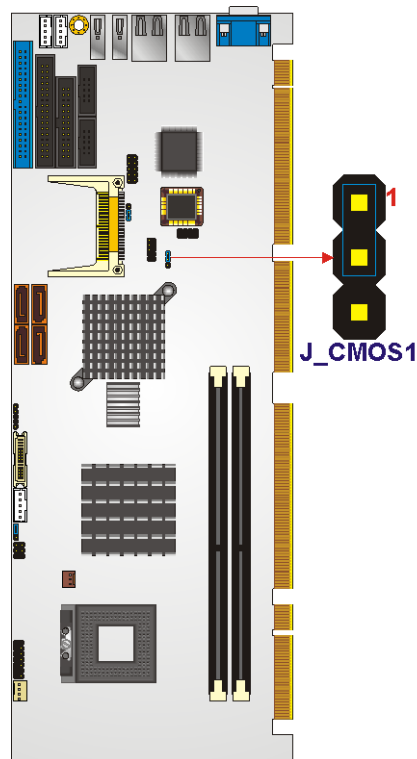


Figure 5-10: Clear CMOS Jumper

5.4.3 LVDS Voltage Selection

**WARNING:**

Permanent damage to the screen and PCIE-9452 may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that came with the monitor to select the correct voltage.

Jumper Label:	J_VLVDS1
Jumper Type:	3-pin header
Jumper Settings:	See Table 5-4
Jumper Location:	See Figure 5-11

The **LVDS Voltage Selection** jumper allows the LVDS screen voltage to be set. The **LVDS Voltage Selection** jumper settings are shown in **Table 5-4**.

AT Power Select	Description	
Short 1-2	+3V LVDS	Default
Short 2-3	+5V LVDS	

Table 5-4: LVDS Voltage Selection Jumper Settings

The LVDS Voltage Selection jumper location. is shown in **Figure 5-11**.

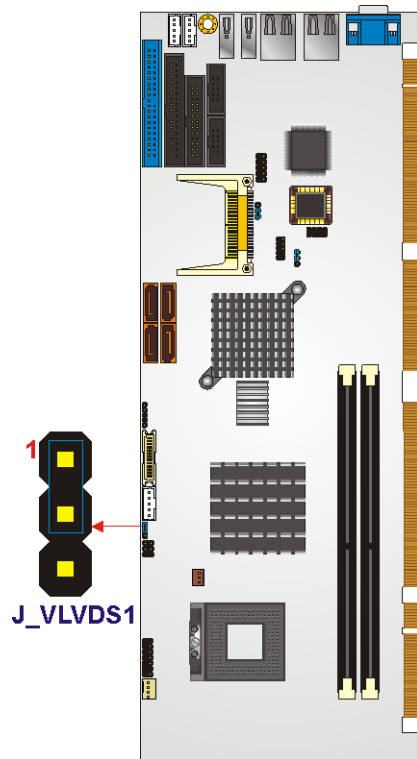


Figure 5-11: LVDS Voltage Selection Jumper Pinout Locations

5.5 Chassis Installation

5.5.1 Airflow



WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the PCIE-9452 must have air vents to allow cool air to move into the system and hot air to move out.

The PCIE-9452 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

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NOTE:

IEI has a wide range of backplanes available. Please contact your PCIE-9452 vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (<http://www.ieiworld.com.tw>) to find out more about the available chassis.

5.5.2 Backplane Installation

Before the PCIE-9452 can be installed into the chassis, a backplane must first be installed. Please refer to the installation instructions that came with the backplane and the chassis to see how to install the backplane into the chassis.



NOTE:

IEI has a wide range of backplanes available. Please contact your PCIE-9452 vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (<http://www.ieiworld.com.tw>) to find out more about the available chassis.

5.5.3 CPU Card Installation

To install the PCIE-9452 CPU card onto the backplane, carefully align the CPU card interface connectors with the corresponding socket on the backplane. To do this, please refer to the reference material that came with the backplane. Next, secure the CPU card to the chassis. To do this, please refer to the reference material that came with the chassis.

5.6 Internal Peripheral Device Connections

5.6.1 Peripheral Device Cables

The cables listed in **Table 5-5** are shipped with the PCIE-9452.

Quantity	Type
1	IDE Cable
1	KB/MS cable
2	SATA drive cables
1	SATA drive power cable

Table 5-5: IEI Provided Cables

Optional cables are listed below:

- TV out cable
- LPT cable
- FDD cable
- 5-pin wafer-to-PS/2 cable for mouse or keyboard
- 7.1 channel audio kit
- 5.1 channel audio kit

5.6.2 IDE Cable Connection

The IDE flat cable connects to the PCIE-9452 to one or two IDE devices. To connect an IDE HDD to the PCIE-9452 please follow the instructions below.

Step 1: Locate the IDE connector. The location/s of the IDE device connector/s is/are shown in **Chapter 3**..

Step 2: Insert the connector. Connect the IDE cable connector to the onboard connector. See **Figure 5-12**. A key on the front of the cable connector ensures it can only be inserted in one direction.

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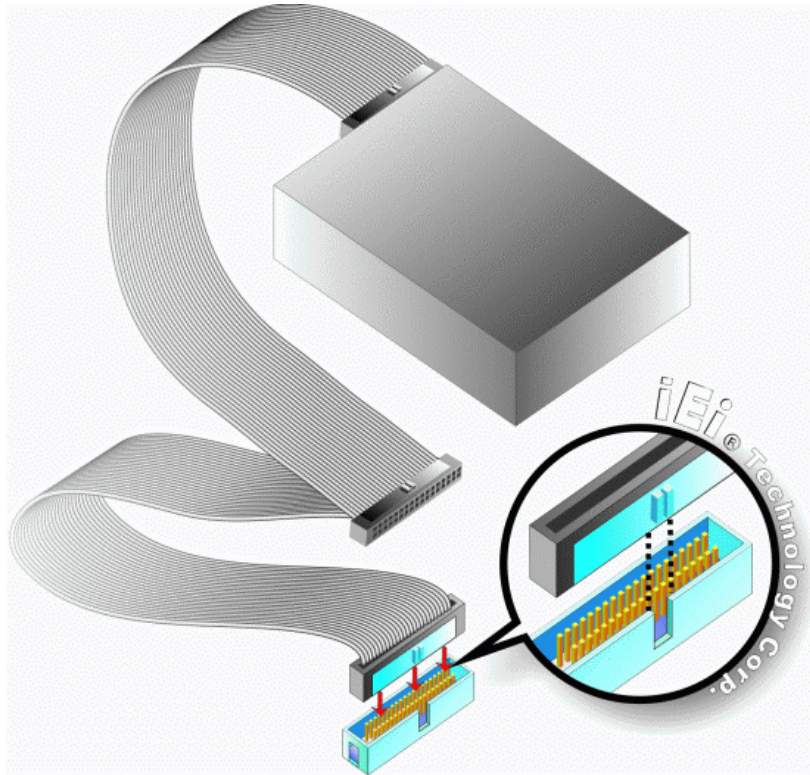


Figure 5-12: IDE Cable Connection

Step 3: **Connect the cable to an IDE device.** Connect the two connectors on the other side of the cable to one or two IDE devices. Make sure that pin 1 on the cable corresponds to pin 1 on the connector

5.6.3 5.1 Channel Audio Kit Installation



NOTE:

This is an optional item that must be ordered separately. For further information please contact the nearest PCIE-9452 distributor, reseller or vendor or contact an iEi sales representative directly. Send any queries to sales@iei.com.tw.

The optional 5.1 channel audio kit connects to the 10-pin audio connector on the PCIE-9452. The audio kit consists of three audio jacks. One audio jack, Mic In, connects to a microphone. The remaining two audio jacks, Line-In and Line-Out, connect to two speakers. To install the audio kit, please refer to the steps below:

- Step 1: Connect the audio kit cable.** The audio kit is shipped with a cable that connects the audio kit to the PCIE-9452. Connect the cable to the connector on the back of the audio kit. Make sure the pins are properly aligned (i.e. pin 1 connects to pin 1).
- Step 2: Locate the audio connector.** The location of the 10-pin audio connector is shown in **Chapter 3**.
- Step 3: Align pin 1.** Align pin 1 on the onboard connector with pin 1 on the audio kit cable connector. Pin 1 on the audio kit cable connector is indicated with a white dot. See **Figure 5-13**.

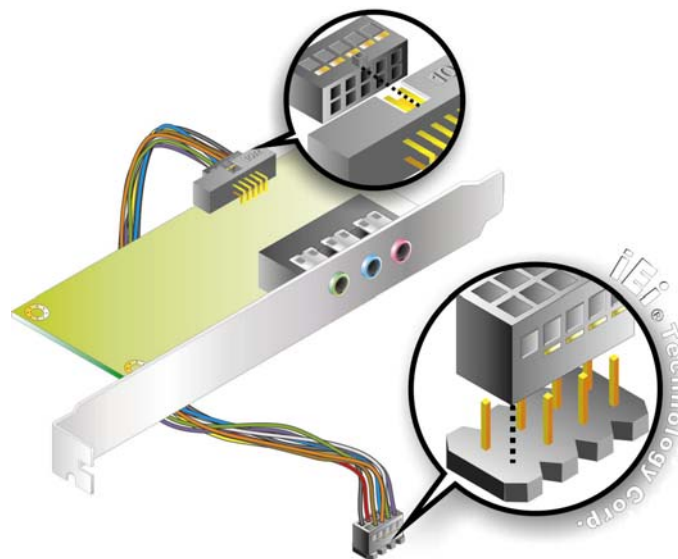


Figure 5-13: 5.1 Channel Audio Kit

- Step 4: Mount the audio kit onto the chassis.** Once the audio kit is connected to the PCIE-9452, secure the audio kit bracket to the system chassis.
- Step 5: Connect the audio devices.** Connect one speaker to the line-in audio jack, one

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speaker to the line-out audio jack and a microphone to the mic-in audio jack.

Step 6: Install the driver. If the 5.1 channel audio kit is used, the ALC655 Realtek codec driver must be installed. Refer to **Chapter 7** for driver installation instructions.

5.6.4 7.1 Channel Audio Kit Installation



NOTE:

This is an optional item that must be ordered separately. For further information please contact the nearest PCIE-9452 distributor, reseller or vendor or contact an iEi sales representative directly. Send any queries to sales@iei.com.tw.

The optional 7.1 channel audio kit connects to the 10-pin audio connector on the PCIE-9452. The audio kit consists of five audio jacks. One audio jack, Mic In, connects to a microphone. The remaining four audio jacks, Line-In, Front-Out, Rear-Out, and Center Subwoofer, connect to speakers. To install the audio kit, please refer to the steps below:

Step 1: Connect the audio kit cable. The audio kit is shipped with a cable that connects the audio kit to the PCIE-9452. Connect the cable to the connector on the back of the audio kit. Make sure the pins are properly aligned (i.e. pin 1 connects to pin 1).

Step 2: Locate the audio connector. The location of the 10-pin audio connector is shown in **Chapter 3**.

Step 3: Align pin 1. Align pin 1 on the onboard connector with pin 1 on the audio kit cable connector. Pin 1 on the audio kit cable connector is indicated with a white dot. See **Figure 5-13**.

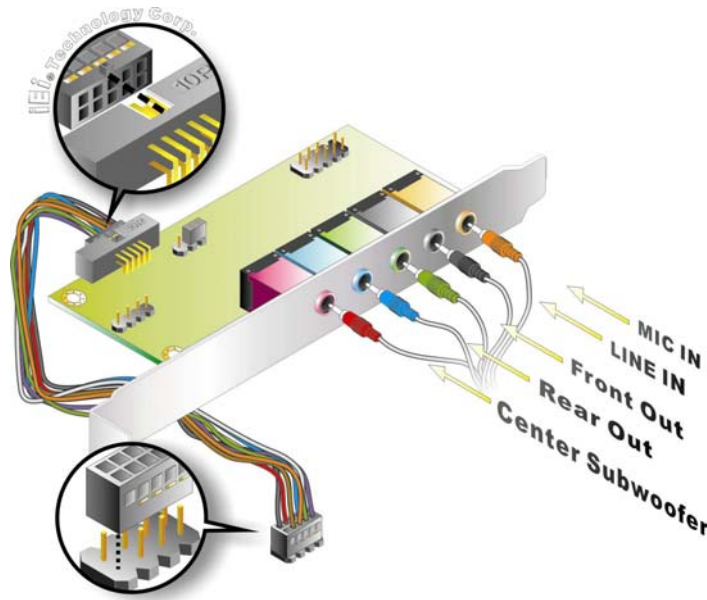


Figure 5-14: 5.1 Channel Audio Kit

Step 4: Mount the audio kit onto the chassis. Once the audio kit is connected to the PCIE-9452, secure the audio kit bracket to the system chassis.

Step 5: Connect the audio devices. Connect one speaker to the line-in audio jack, one speaker to the line-out audio jack and a microphone to the mic-in audio jack.

Step 6: Install the driver. If the 5.1 channel audio kit is used, the ALC655 Realtek codec driver must be installed. Refer to **Chapter 7** for driver installation instructions.

5.6.5 Parallel Port Cable

The optional parallel port (LPT) cable respectively connects the onboard LPT 26-pin box header to an external LPT device (like a printer). The cable comprises a 26-pin female header, to be connected to the onboard LPT box-header, on one side and on the other side a standard external LPT connector. To connect the LPT cable, please follow the steps below.

Step 1: Locate the connector. The LPT connector location is shown in **Chapter 4**.

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Step 2: Align the connectors. Correctly align pin 1 on the cable connector with pin 1 on the PCIE-9452 LPT box-header connector. See **Figure 5-15**.

Step 3: Insert the cable connectors Once the cable connector is properly aligned with the 26-pin box-header connector on the PCIE-9452, connect the cable connector to the onboard connector. See **Figure 5-15**.

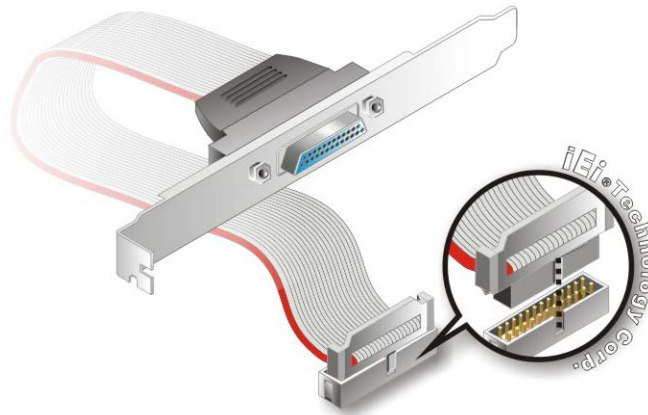


Figure 5-15: LPT Cable Connection

Step 4: Attach the LPT connector bracket to the chassis. The LPT cable connector is connected to a standard external LPT interface connector. To secure the LPT interface connector to the chassis please refer to the installation instructions that came with the chassis.

Step 5: Connect LPT device. Once the LPT interface connector is connected to the chassis, the LPT device can be connected to the LPT interface connector. See **Figure 5-16**

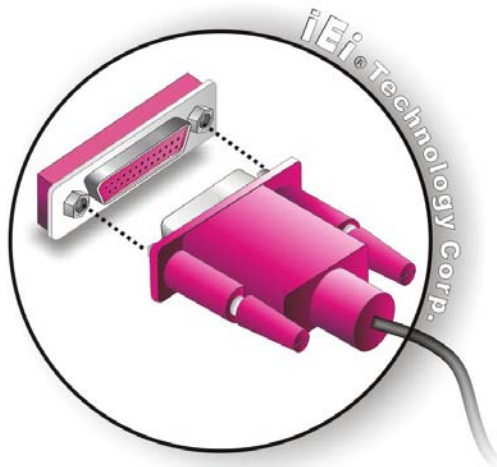


Figure 5-16: Connect the LPT Device

5.6.6 Dual RS-232 Cable Connection

The dual RS-232 cable consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9 male connector that is mounted onto a bracket. To install the dual RS-232 cable, please follow the steps below.

Step 1: Locate the connectors. The locations of the RS-232 connectors are shown in Chapter 3.

Step 2: Insert the cable connectors. Insert one connector into each serial port box headers. See **Figure 5-17**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

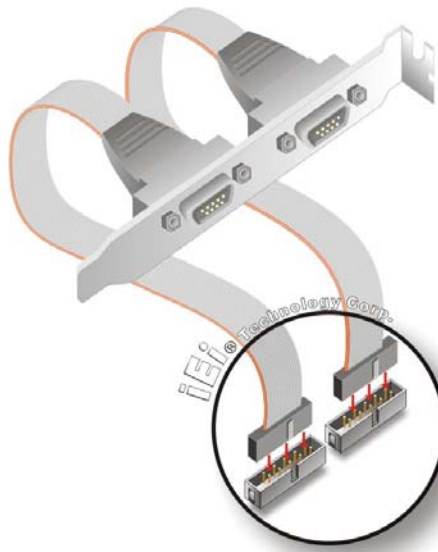


Figure 5-17: Dual RS-232 Cable Installation

Step 3: Secure the bracket. The dual RS-232 connector has two D-sub 9 male connectors secured on a bracket. To secure the bracket to the chassis please refer to the reference material that came with the chassis

5.6.7 USB Cable (Dual Port)

The PCIE-9452 is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

Step 1: Locate the connectors. The locations of the USB connectors are shown in Chapter 3.



WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: Align the connectors. The cable has two connectors. Correctly align pin 1 on each cable connector with pin 1 on the PCIE-9452 USB connector.

Step 3: Insert the cable connectors Once the cable connectors are properly aligned with the USB connectors on the PCIE-9452, connect the cable connectors to the onboard connectors. See **Figure 5-18**.

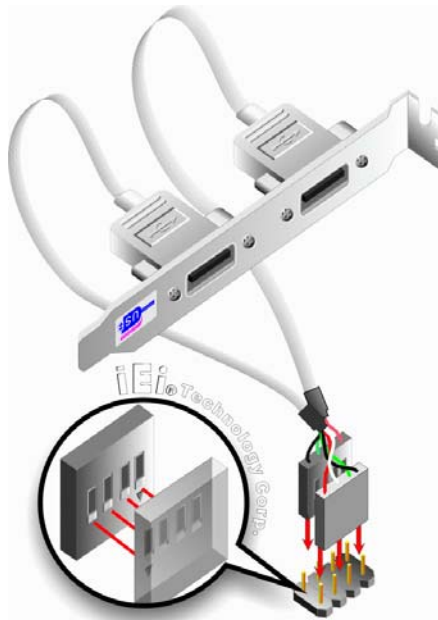


Figure 5-18: Dual USB Cable Connection

Step 4: Attach the bracket to the chassis. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

5.6.8 SATA Drive Connection

The PCIE-9452 is shipped with two SATA drive cables and one SATA drive power cable. To connect the SATA drives to the connectors, please follow the steps below.

Step 1: Locate the connectors. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: Insert the cable connector. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See **Figure 5-19**.

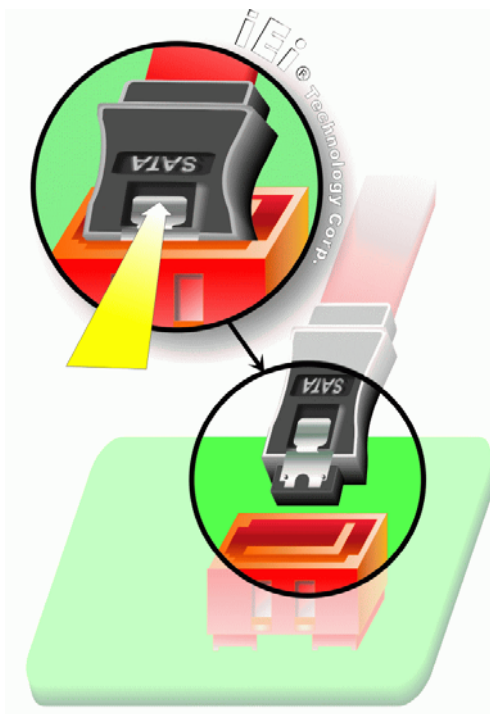


Figure 5-19: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk.** Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 5-20**.

Step 4: **Connect the SATA power cable.** Connect the SATA power connector to the back of the SATA drive. See **Figure 5-20**.



Figure 5-20: SATA Power Drive Connection

5.6.9 Wafer-to-PS/2 Cable (Keyboard/Mouse Installation)

The optional wafer-to-PS/2 cable respectively connects the onboard keyboard wafer connector and the onboard mouse wafer connector to a PS/2 keyboard and a PS/2 mouse. To connect the wafer-to-PS/2 cable, please follow the steps below.

- Step 1: Locate the connector.** The location of the keyboard/mouse connector is shown in **Chapter 4**.
- Step 2: Align the connectors.** Correctly align pin 1 on the cable connector with pin 1 on the PCIE-9452 keyboard or mouse connector. See **Figure 5-21**.
- Step 3: Insert the cable connectors** Once the cable connector is properly aligned with the keyboard/mouse connector on the PCIE-9452, connect the cable connector to the onboard connectors. See **Figure 5-21**.

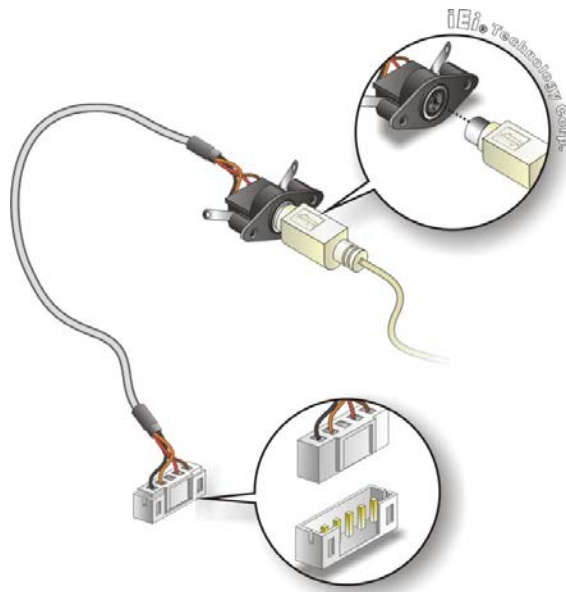


Figure 5-21: Keyboard/mouse Cable Connection

- Step 4:** **Attach PS/2 connector to the chassis.** The wafer-to-PS/2 cable connector is connected to a PS/2 connector. To secure the PS/2 connector to the chassis please refer to the installation instructions that came with the chassis.
- Step 5:** **Connect the keyboard or mouse.** Once the PS/2 connector is connected to the chassis, the wafer-to-PS/2 cable connected to the keyboard connector can be connected to the PS/2 connector on a keyboard and the wafer-to-PS/2 cable connected to the mouse connector can be connected to the PS/2 connector on a PS/2 mouse.

5.7 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- VGA monitors
- RJ-45 Ethernet cable connectors
- USB devices

To install these devices, connect the corresponding cable connector from the actual device to the corresponding PCIE-9452 external peripheral interface connector making sure the pins are properly aligned.

5.7.1 LAN Connection (Single Connector)

There are two external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connectors.** The locations of the USB connectors are shown in **Chapter 4**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the PCIE-9452. See **Figure 5-22**.

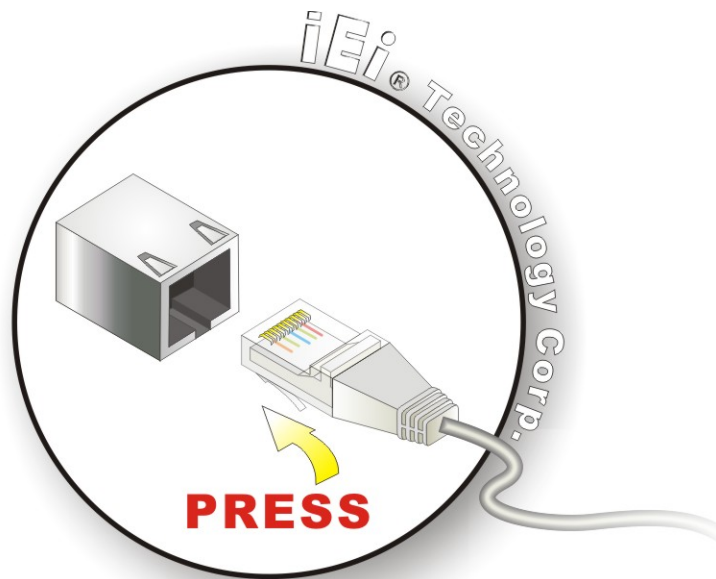


Figure 5-22: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the onboard RJ-45 connector.

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5.7.2 USB Device Connection (Single Connector)

There are two external USB 2.0 connectors. Both connectors are perpendicular to the PCIE-9452. To connect a USB 2.0 or USB 1.1 device, please follow the instructions below.

Step 1: Located the USB connectors. The locations of the USB connectors are shown in **Chapter 4**.

Step 2: Align the connectors. Align the USB device connector with one of the connectors on the PCIE-9452. See **Figure 5-22**.

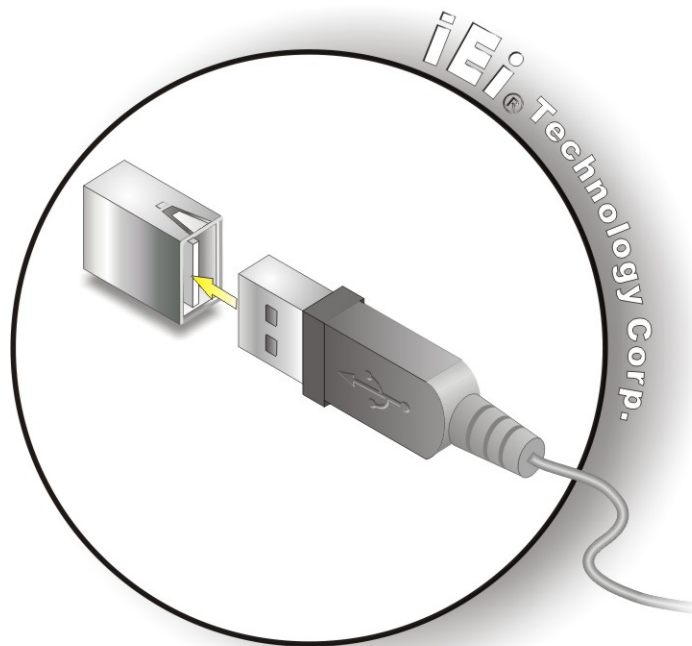


Figure 5-23: USB Device Connection

Step 3: Insert the device connector. Once aligned, gently insert the USB device connector into the onboard connector.

5.7.3 VGA Monitor Connection

The PCIE-9452 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the PCIE-9452, please follow the instructions below.

- Step 1: Locate the female DB-15 connector.** The location of the female DB-15 connector is shown in **Chapter 3**.
- Step 2: Align the VGA connector.** Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.
- Step 3: Insert the VGA connector** Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the PCIE-9452. See **Figure 5-24**.

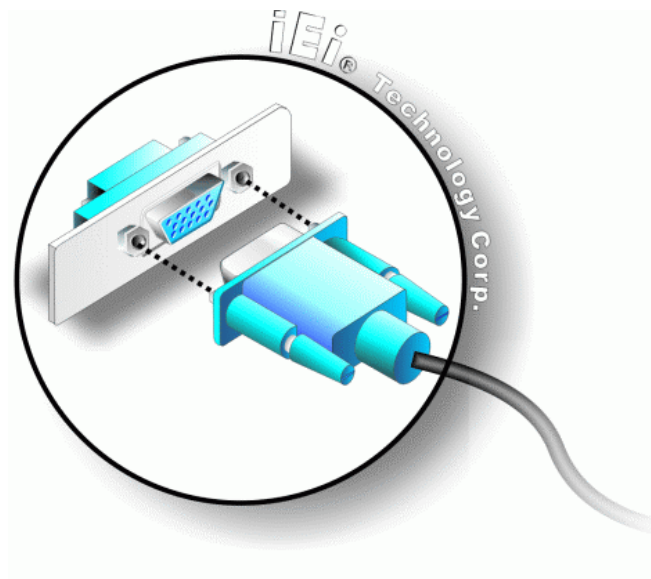


Figure 5-24: VGA Connector

- Step 4: Secure the connector.** Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

Chapter

6

AMI BIOS

6.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

6.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the “**Press Del to enter SETUP**” message appears on the screen.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

6.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **Esc** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes

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Key	Function
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 6-1: BIOS Navigation Keys

6.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

6.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in **Chapter 5**.

6.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

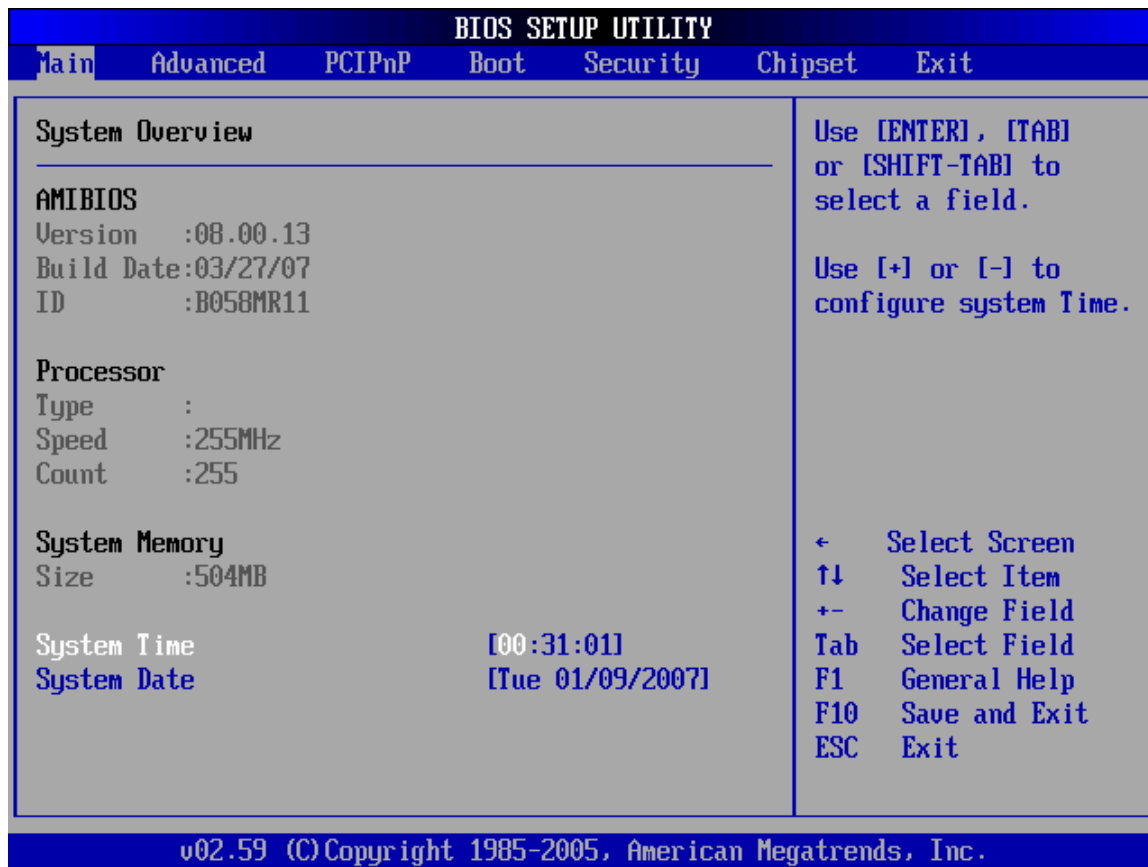
- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **PCIPnP** Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Power** Changes power management settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

6.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered.

The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

→ System Overview

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- **AMI BIOS:** Displays auto-detected BIOS information
 - **Version:** Current BIOS version
 - **Build Date:** Date the current BIOS version was made
 - **ID:** Installed BIOS ID

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- **Processor:** Displays auto-detected CPU specifications
 - **Type:** Names the currently installed processor
 - **Speed:** Lists the processor speed
 - **Count:** The number of CPUs on the motherboard
- **System Memory:** Displays the auto-detected system memory.
 - **Size:** Lists memory size

The **System Overview** field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

6.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

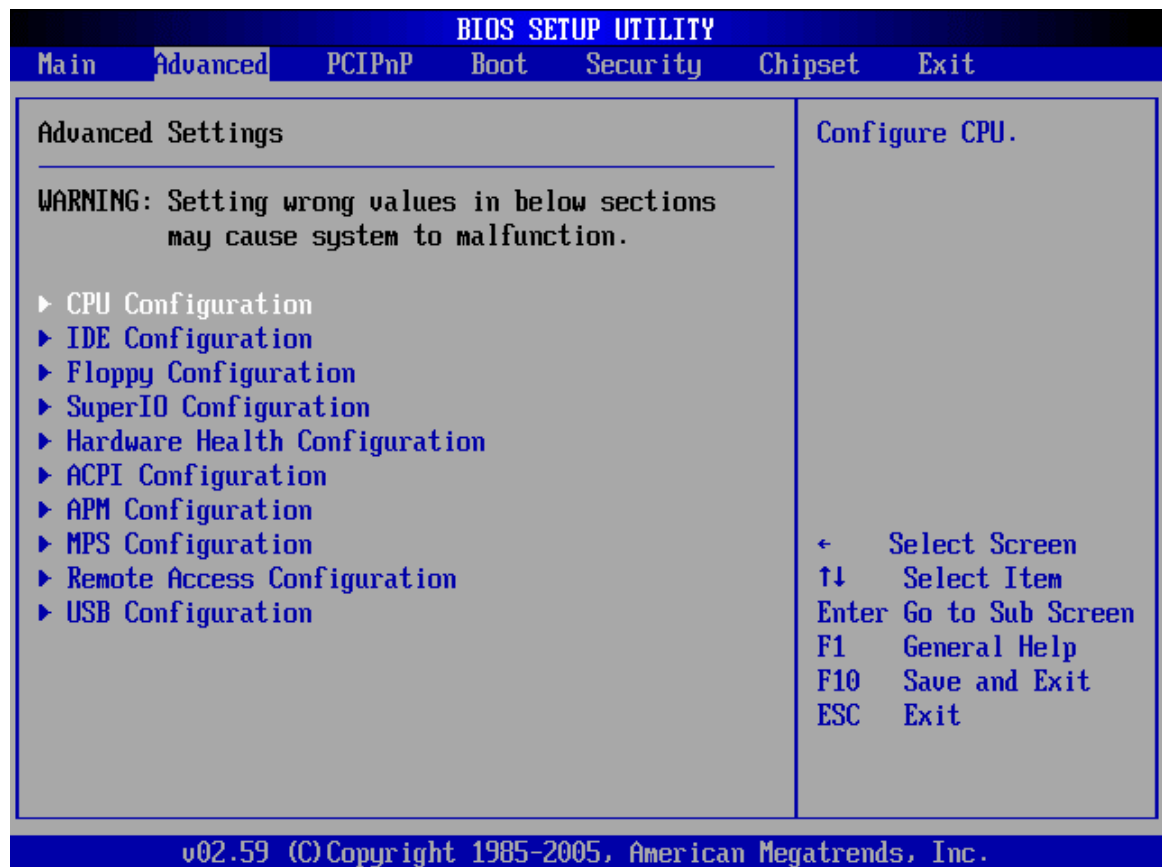


WARNING:

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

- CPU Configuration (see Section 6.3.1)
- IDE Configuration (see Section 6.3.2)
- Floppy Configuration
- SuperIO Configuration (see Section 6.3.3)
- Hardware Health Configuration (see Section 6.3.5)

- ACPI Configuration (see Section 6.3.6)
- APM Configuration (See Section 6.3.6)
- MPS Configuration (see Section 6.3.7)
- Remote Access Configuration (see Section 0)
- USB Configuration (see Section 0)

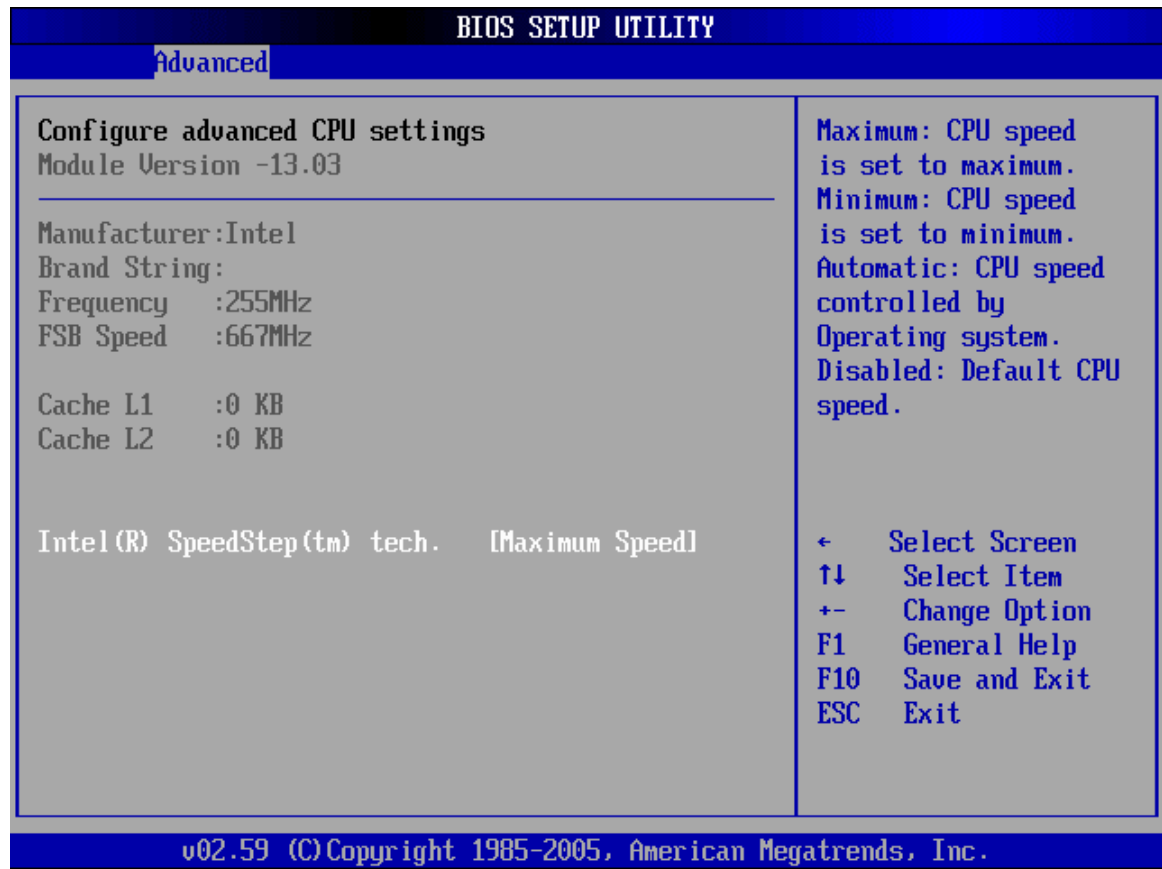


BIOS Menu 2: Advanced

6.3.1 CPU Configuration

Use the **CPU Configuration** menu (BIOS Menu 3) to view detailed CPU specifications and configure the CPU.

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BIOS Menu 3: CPU Configuration

The **CPU Configuration** menu (**BIOS Menu 3**) lists the following CPU details:

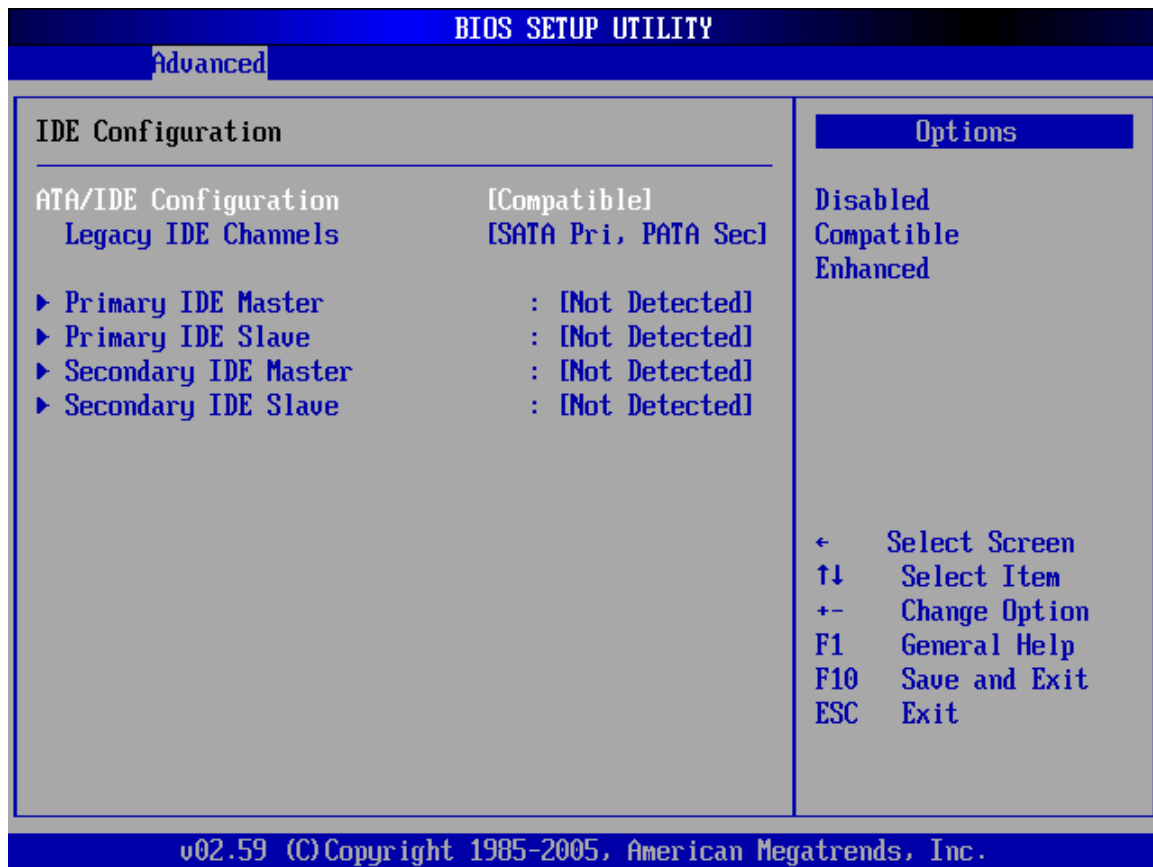
- **Manufacturer:** Lists the name of the CPU manufacturer
- **Brand String:** Lists the brand name of the CPU being used
- **Frequency:** Lists the CPU processing speed
- **FSB Speed:** Lists the FSB speed
- **Cache L1:** Lists the CPU L1 cache size
- **Cache L2:** Lists the CPU L2 cache size

The following **CPU Configuration** menu items can be configured.

- Intel® SpeedStep™ tech.

6.3.2 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.



BIOS Menu 4: IDE Configuration

- ➔ **ATA/IDE Configurations [Compatible]**
 - ➔ **Disabled** (Default)
 - ➔ **Compatible**
 - ➔ **Enhanced**

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→ Legacy IDE Channels [PATA Pri, SATA Sec]

- SATA Only
- PATA Pri, SATA Sec
- SATA Pri., PATA Sec (Default)
- PATA Only

→ IDE Master and IDE Slave

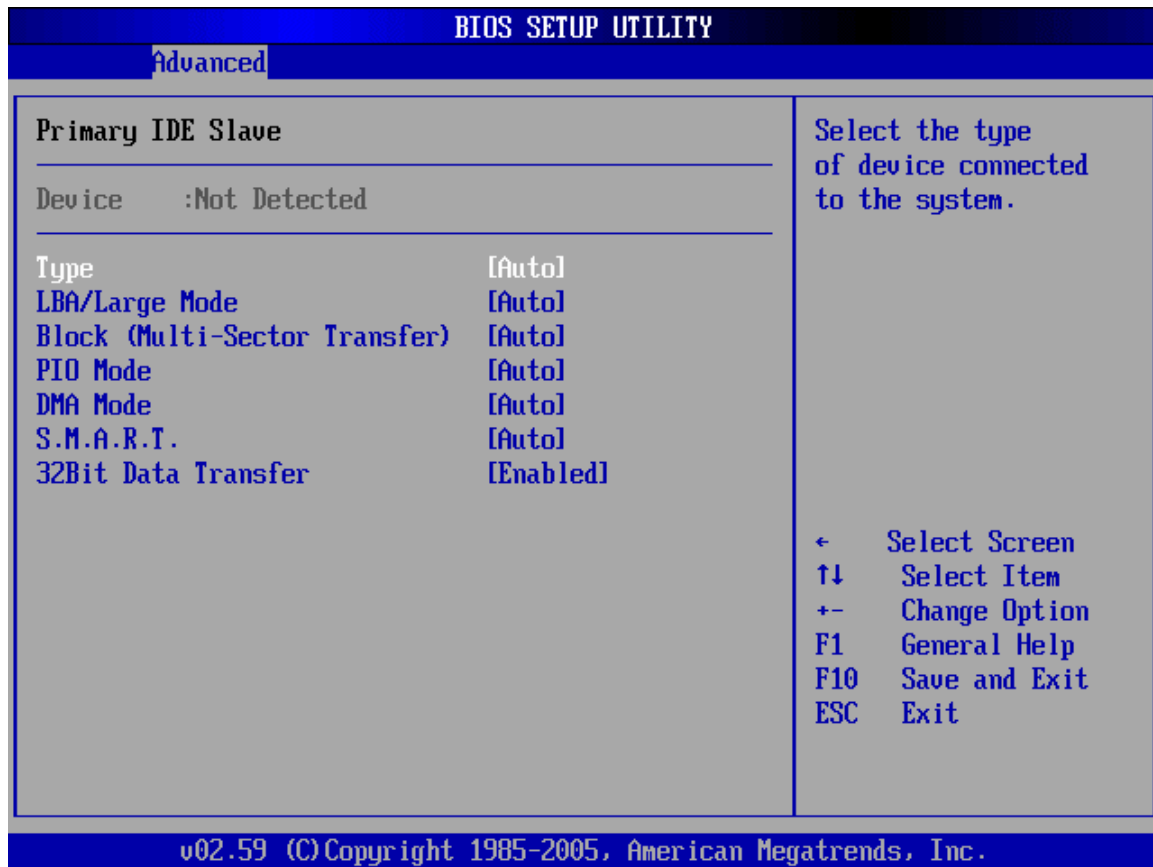
When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 6.3.2.1** appear.

6.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ Auto-Detected Drive Parameters

The “grayed-out” items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- **Device:** Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Type:** Indicates the type of devices a user can manually select
- **Vendor:** Lists the device manufacturer
- **Size:** List the storage capacity of the device.
- **LBA Mode:** Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- **Block Mode:** Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per

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interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.

- **PIO Mode:** Indicates the PIO mode of the installed device.
- **Async DMA:** Indicates the highest Asynchronous DMA Mode that is supported.
- **Ultra DMA:** Indicates the highest Synchronous DMA Mode that is supported.
- **S.M.A.R.T.:** Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- **32Bit Data Transfer:** Enables 32-bit data transfer.

→ Type [Auto]

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

- | | | | |
|---|----------------------|----------------|---|
| → | Not Installed | | BIOS is prevented from searching for an IDE disk drive on the specified channel. |
| → | Auto | DEFAULT | The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel. |
| → | CD/DVD | | The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel. |
| → | ARMD | | This option specifies an ATAPI Removable Media Device. These include, but are not limited to: |

→ **ZIP**

→ **LS-120**

➔ **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

- ➔ **Disabled** BIOS is prevented from using the LBA mode control on the specified channel.
- ➔ **Auto** **DEFAULT** BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

- ➔ **Disabled** BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.
- ➔ **Auto** **DEFAULT** BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

- ➔ **Auto** **DEFAULT** BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.

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- 0 PIO mode 0 selected with a maximum transfer rate of 3.3MBps
 - 1 PIO mode 1 selected with a maximum transfer rate of 5.2MBps
 - 2 PIO mode 2 selected with a maximum transfer rate of 8.3MBps
 - 3 PIO mode 3 selected with a maximum transfer rate of 11.1MBps
 - 4 PIO mode 4 selected with a maximum transfer rate of 16.6MBps
- (This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

→ DMA Mode [Auto]

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

- **Auto** **DEFAULT** BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
- **SWDMA0** Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1MBps
- **SWDMA1** Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2MBps
- **SWDMA2** Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3MBps
- **MWDMA0** Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2MBps
- **MWDMA1** Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3MBps
- **MWDMA2** Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6MBps

- ➔ **UDMA1** Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6MBps
- ➔ **UDMA1** Ultra DMA mode 1 selected with a maximum data transfer rate of 25MBps
- ➔ **UDMA2** Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3MBps
- ➔ **UDMA3** Ultra DMA mode 3 selected with a maximum data transfer rate of 44MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
- ➔ **UDMA4** Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
- ➔ **UDMA5** Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

- ➔ **Auto** **DEFAULT** BIOS auto detects HDD SMART support.
- ➔ **Disabled** Prevents BIOS from using the HDD SMART feature.
- ➔ **Enabled** Allows BIOS to use the HDD SMART feature

➔ **32Bit Data Transfer [Enabled]**

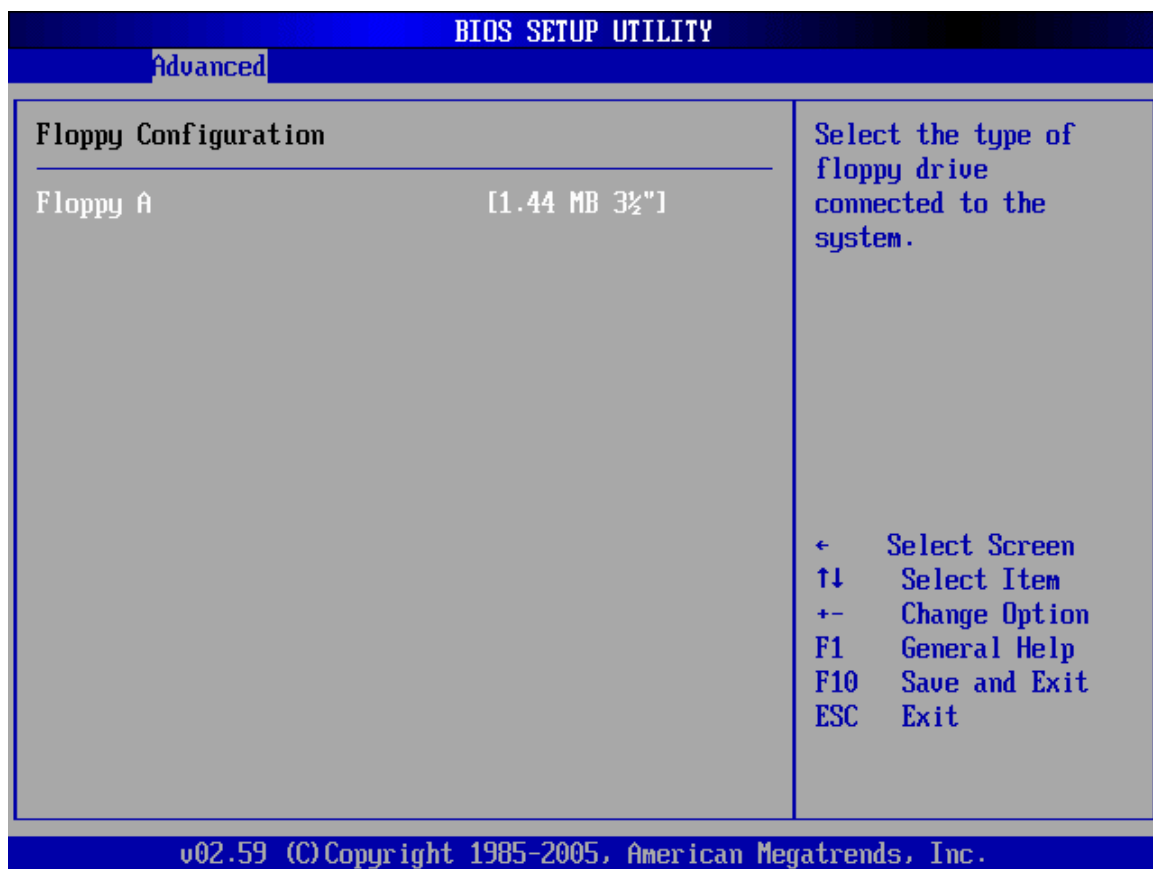
Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

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- ➔ **Disabled** Prevents the BIOS from using 32-bit data transfers.
- ➔ **Enabled** **DEFAULT** Allows BIOS to use 32-bit data transfers on supported hard disk drives.

6.3.3 Floppy Configuration

Use the **Floppy Configuration** menu to configure the floppy disk drive connected to the system.



BIOS Menu 6: Floppy Configuration

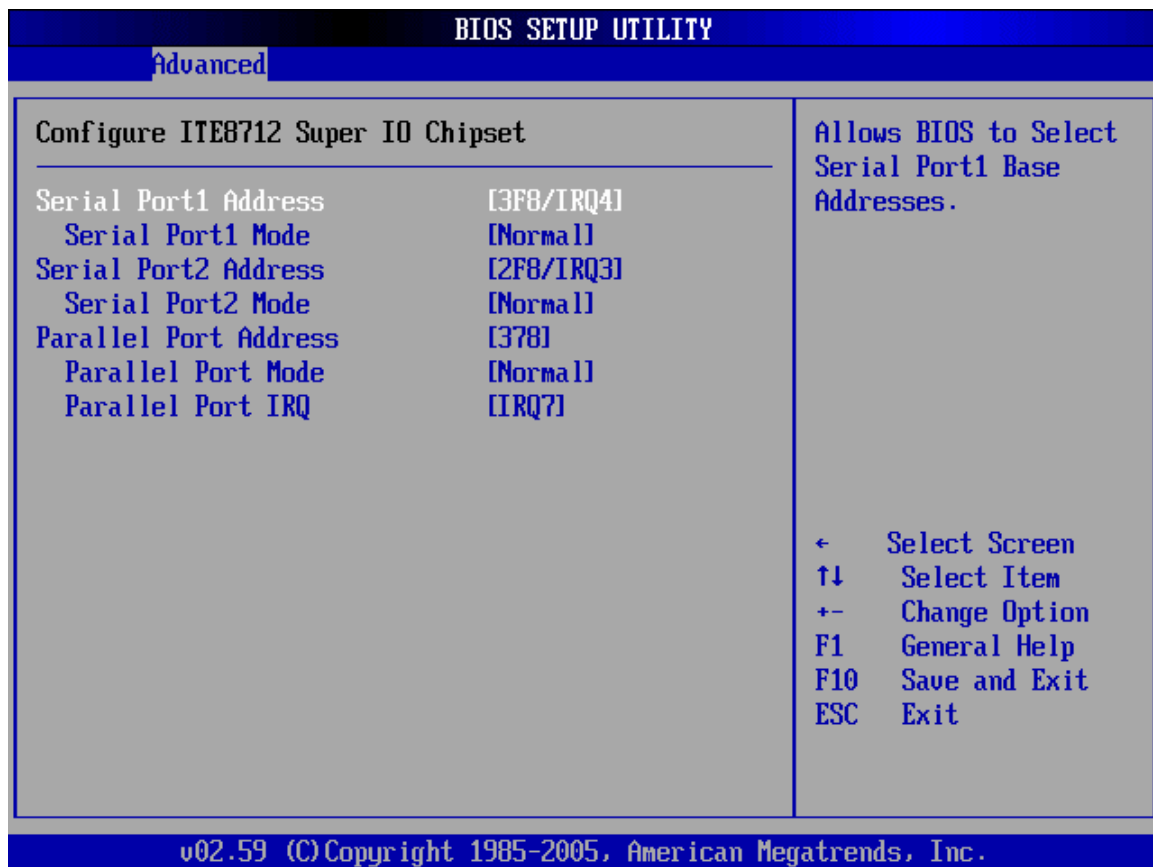
- ➔ **Floppy A/B**

Use the **Floppy A/B** option to configure the floppy disk drive. Options are listed below:

- Disabled
- 360 KB 5 1/4"
- 1.2 MB 5 1/4"
- 720 KB 3 1/2"
- 1.44 MB 3 1/2" **DEFAULT**
- 2.88 MB 3 1/2"

6.3.4 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 7**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 7: Super IO Configuration

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→ **Serial Port1 Address [3F8/IRQ4]**

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

- **Disabled** No base address is assigned to Serial Port 1
- **3F8/IRQ4** **DEFAULT** Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4
- **3E8/IRQ4** Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
- **2E8/IRQ3** Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

→ **Serial Port1 Mode [Normal]**

Use the **Serial Port1 Mode** option to select the transmitting and receiving mode for the first serial port.

- **Normal** (Default) Serial Port 1 mode is normal
- **ASK IR** Serial Port 1 mode is ASK IR

→ **Serial Port2 Address [2F8/IRQ3]**

Use the **Serial Port2 Address** option to select the Serial Port 2 base address.

- **Disabled** No base address is assigned to Serial Port 2
- **2F8/IRQ3** **DEFAULT** Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3
- **3E8/IRQ4** Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
- **2E8/IRQ3** Serial Port 2 I/O port address is 2E8 and the interrupt

address is IRQ3

→ Serial Port2 Mode [Normal]

Use the **Serial Port2 Mode** option to select the Serial Port2 operational mode.

- **Normal** **DEFAULT** Serial Port 2 mode is normal
- **IrDA** Serial Port 2 mode is IrDA
- **ASK IR** Serial Port 2 mode is ASK IR

→ Parallel Port Address [Disabled]

Use the **Parallel Port Address** option to select the parallel port base address.

- **Disabled** **DEFAULT** No base address is assigned to the Parallel Port
- **378** Parallel Port I/O port address is 378
- **278** Parallel Port I/O port address is 278
- **3BC** Parallel Port I/O port address is 3BC

→ Parallel Port Mode [Normal]

Use the **Parallel Port Mode** option to select the mode the parallel port operates in.

- **Normal** **DEFAULT** The normal parallel port mode is the standard mode for parallel port operation.
- **EPP** The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode.

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➔ ECP

The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode

➔ ECP+EPP

The parallel port is also be compatible with EPP and ECP `devices described above

➔ Parallel Port IRQ [IRQ7]

Use the **Parallel Port IRQ** option to set the parallel port interrupt address.

➔ IRQ5

IRQ5 is assigned as the parallel port interrupt address

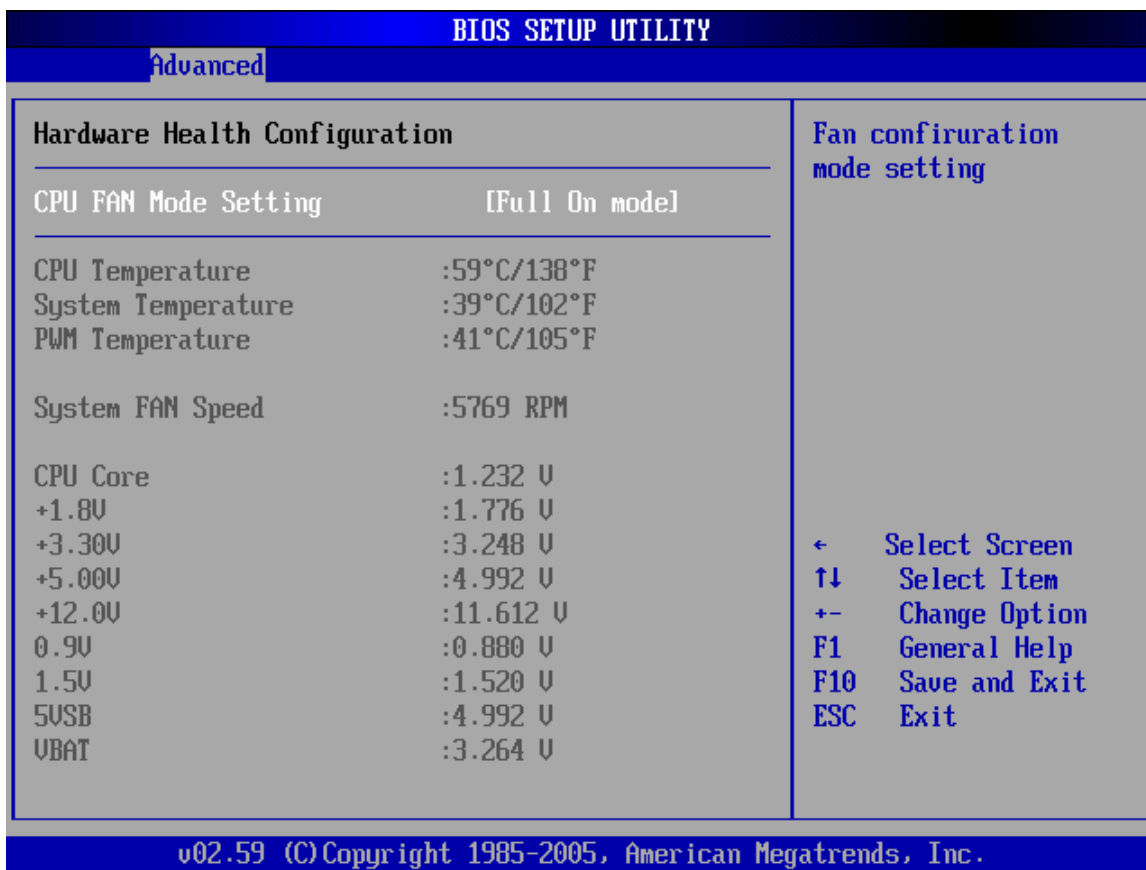
➔ IRQ7

DEFAULT

IRQ7 is assigned as the parallel port interrupt address

6.3.5 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 8**) shows the operating temperature, fan speeds and system voltages.



BIOS Menu 8: Hardware Health Configuration

→ CPU FAN Mode Setting [Full On Mode]

Use the **CPU FAN Mode Setting** option to configure the second fan.

- **Full On Mode** **DEFAULT** Fan is on all the time
- **Automatic mode** Fan is off when the temperature is low enough. Parameters must be set by the user.
- **PWM Manual mode** Pulse width modulation set manually

When the **CPU FAN Mode Setting** option is in the **Automatic Mode**, the following parameters can be set.

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- CPU Temp. Limit of OFF
- CPU Temp. Limit of Start
- CPU Temp. Limit of Full
- CPU Fan Start PWM
- Slope PWM 1

When the **CPU FAN Mode Setting** option is in the **PWM Manual Mode**, the following parameters can be set.

- CPU Fan PWM control

→ CPU Temp. Limit of OFF [000]



WARNING:

Setting this value too high may cause the fan to stop when the CPU is at a high temperature and therefore cause the system to be damaged.

The **CPU Temp. Limit of OFF** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Temp. Limit of OFF** option to select the CPU temperature at which the cooling fan should automatically turn off. To select a value, select the **CPU Temp. Limit of OFF** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- Minimum Value: 0°C
- Maximum Value: 127°C

→ CPU Temp. Limit of Start [020]



WARNING:

Setting this value too high may cause the fan to start only when the CPU is at a high temperature and therefore cause the system to be damaged.

The **CPU Temp. Limit of Start** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Temp. Limit of Start** option to select the CPU temperature at which the cooling fan should automatically turn on. When the fan starts, it rotates using the starting pulse width modulation (PWM) specified in the **Fan 3 Start PWM** option below. To select a value, select the **CPU Temp. Limit of Start** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- Minimum Value: 0°C
- Maximum Value: 127°C

→ CPU Temp. Limit of Full [080]



WARNING:

Setting this value too high may cause the fan to start rotating at full speed only when the CPU is at a high temperature and therefore cause the system to be damaged.

The **CPU Temp. Limit of Full** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Temp. Limit of Full** option to select the CPU temperature at which the cooling fan starts to rotate at full speed. When the CPU temperature exceeds the temperature specified in this option, the fan starts to rotate at full

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speed. To select a value, select the **CPU Temp. Limit of Full** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- Minimum Value: 0°C
- Maximum Value: 127°C

→ CPU Fan Start PWM [070]

The **Fan 3 Start PWM** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **Fan 3 Start PWM** option to select the PWM mode the fan starts to rotate with after the temperature specified in the **Temperature 3 Limit of Start** is exceeded. The Super I/O chipset supports 128 PWM modes. To select a value, select the **Fan 3 Start PWM** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- PWM Minimum Mode: 0
- PWM Maximum Mode: 127

→ Slope PWM 1 [1 PWM]

The **Slope PWM 1** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **Slope PWM 1** option to select the linear rate at which the PWM mode increases with respect to an increase in temperature. A list of available options is shown below:

- 0 PWM
- 1 PWM
- 2 PWM
- 4 PWM
- 8 PWM
- 16 PWM
- 32 PWM
- 64 PWM

→ CPU Fan PWM Control [070]

The **CPU Fan PWM Control** option can only be set if the **CPU FAN Mode Setting** option is set to **Manual Mode**. Use the **CPU Fan PWM Control** option to select PWM duty cycle control. The PWM duty cycle specifies the width of the modulated pulse. A high value ensures a wide pulse and a low value ensures a narrow pulse. To select a value, select the **CPU Fan PWM Control** option and enter a decimal number between 000 and 127. The PWM Duty Cycle control range is specified below.

- PWM Minimum Mode: 0
- PWM Maximum Mode: 127

→ Hardware Health Monitoring

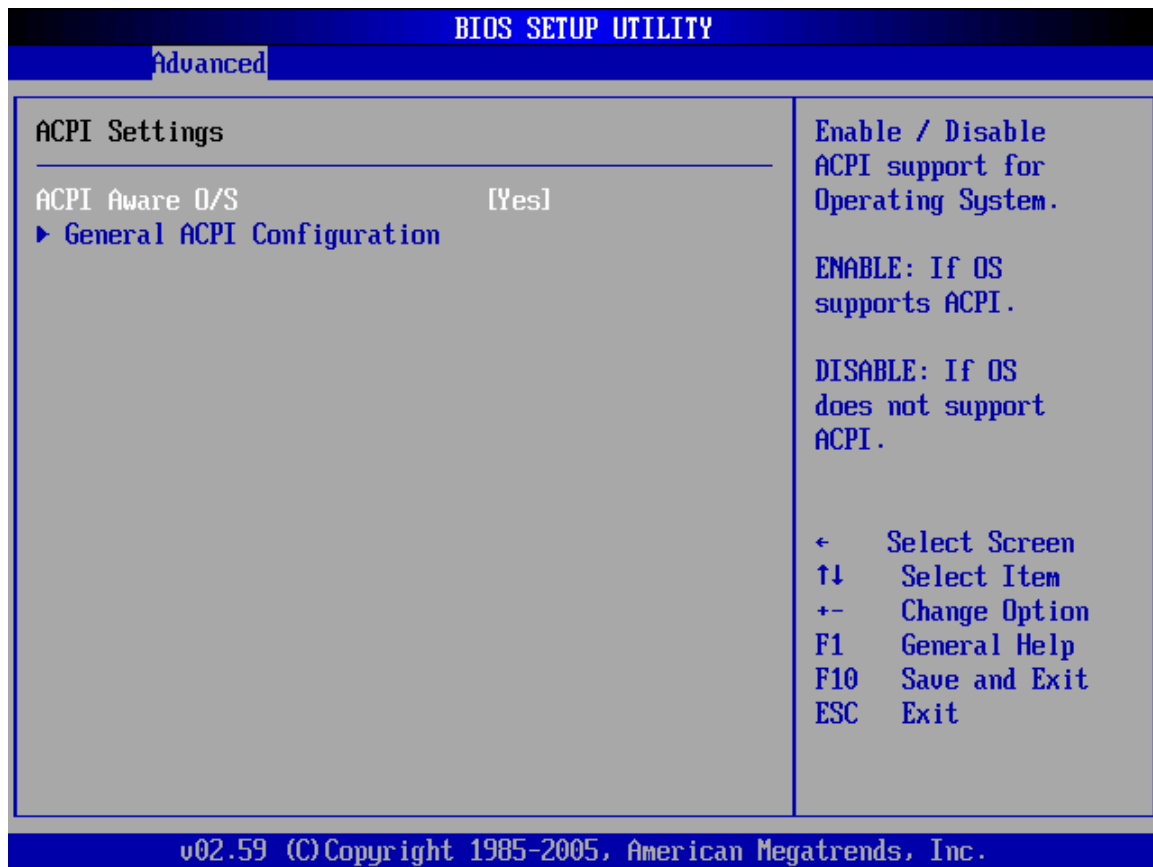
Use the **Hardware Health Configuration** menu (**BIOS Menu 8**) monitor system environmental parameters. The following health parameters are monitored.

- **Temperature monitoring:** The following system temperatures are monitored:
 - CPU Temperature
 - System Temperature
 - PWM Temperature
- **Fan Speed Monitoring:** The following system fan speeds are monitored:
 - System FAN Speed
- **Voltage Monitoring:** The following system voltages are monitored:
 - CPU cCore
 - +1.8V
 - +3.30V
 - +5.00V
 - +12.0V
 - 0.9V
 - 1.5V
 - 5VSB
 - VBAT

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6.3.6 ACPI Configuration

The **ACPI Configuration** menu (**BIOS Menu 9**) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.



BIOS Menu 9: ACPI Configuration

→ **ACPI Aware O/S [Yes]**

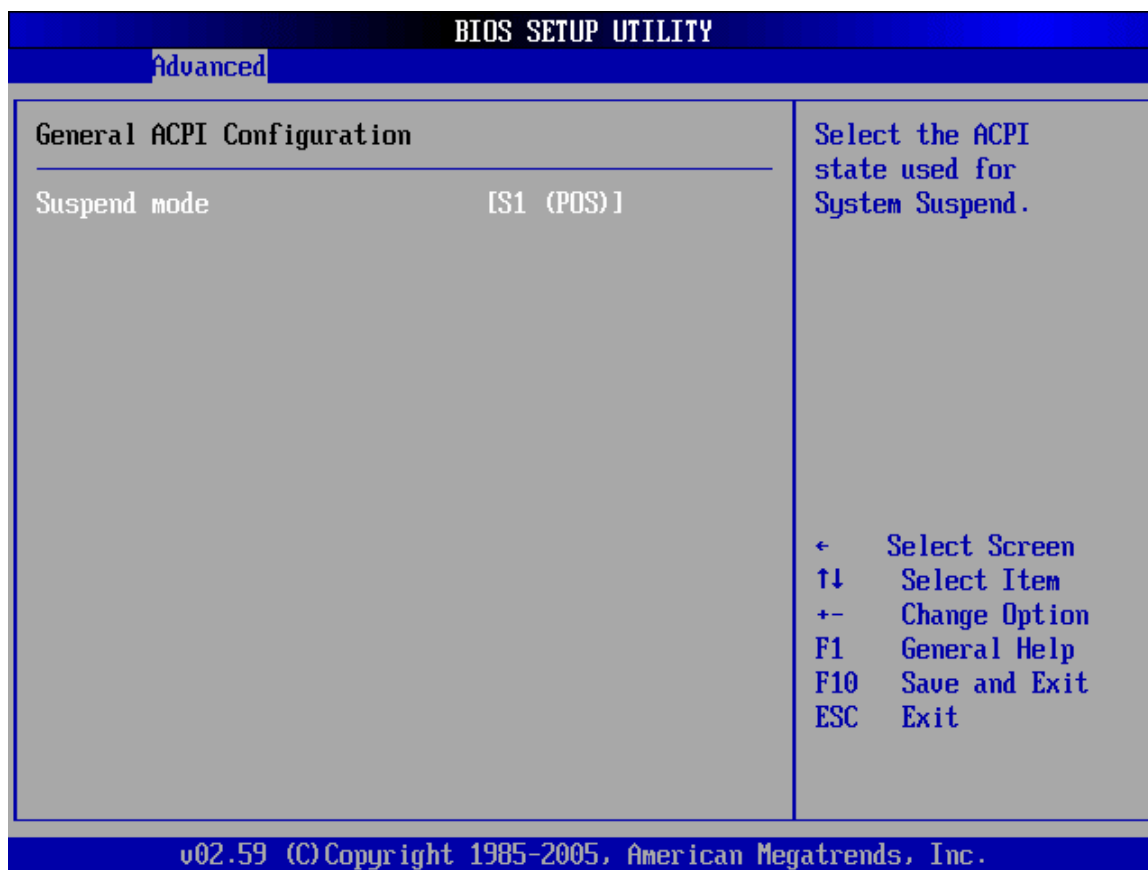
Use the **ACPI Aware O/S** option to enable the system to configure ACPI power saving options. ACPI can only be implemented if the system OS complies with the ACPI standard. Windows 98, Windows 2000, and Windows XP all comply with ACPI.

- **No** Disables the ACPI support for the OS. This selection should be disabled if the OS does not support ACPI

- ➔ **Yes** **DEFAULT** Enables the ACPI support for the operating system. This selection should be enabled if the OS does support ACPI

6.3.6.1 General ACPI Configuration

Use the **General ACPI Configuration** menu (**BIOS Menu 10**) to select the ACPI state when the system is suspended.



BIOS Menu 10: General ACPI Configuration [Advanced\ ACPI Configuration]

- ➔ **Suspend Mode [S1(POS)]**

Use the **Suspend Mode** option to specify the sleep state the system enters when it is not being used.

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- ➔ **S1 (POS) DEFAULT** The system enters S1(POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.
- ➔ **S3 (STR)** The system enters a S3(STR) sleep state. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.
- ➔ **Auto** The BIOS automatically selects a sleep state for the system.

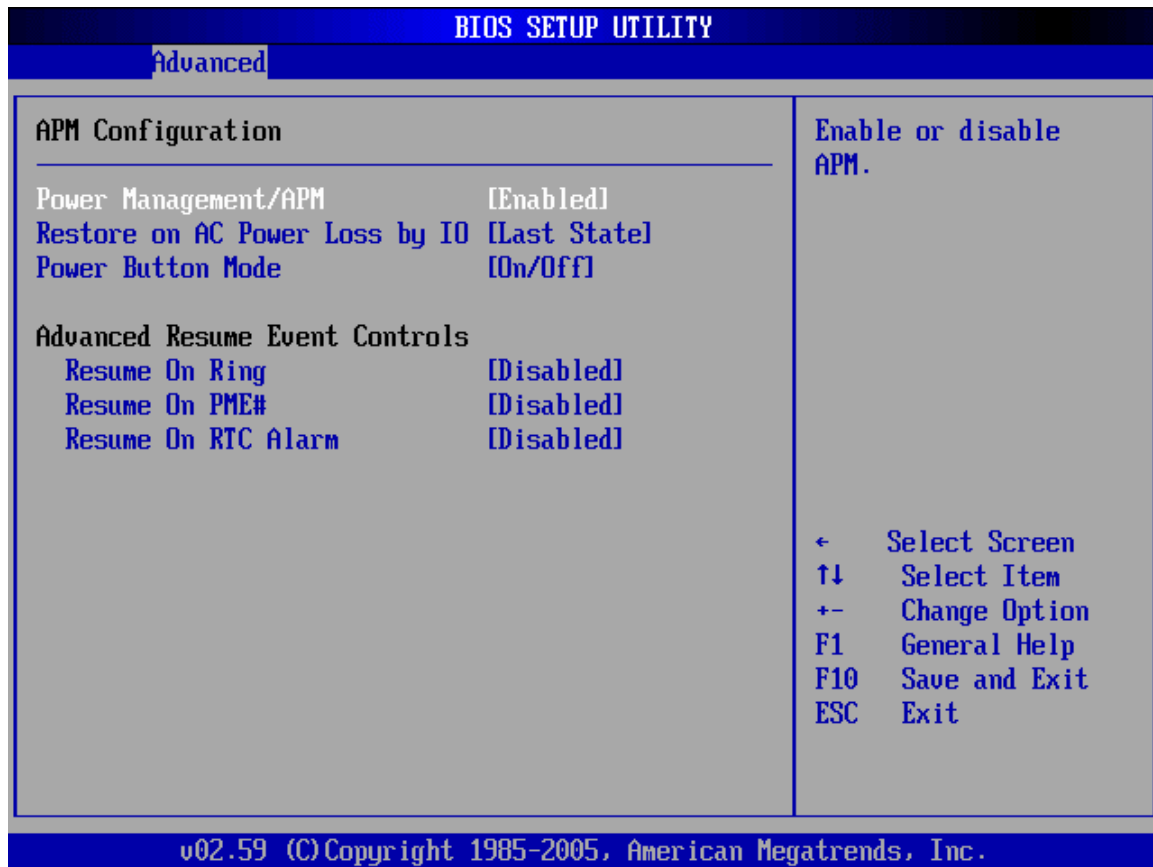
➔ **Repost Video on S3 Resume [No]**

Use the **Repost Video on S3 Resume** to determine whether the VGA BIOS post will be invoked after the system is roused from an S3 (STR) suspend state.

- ➔ **No DEFAULT** The VGA BIOS post is not invoked
- ➔ **Yes** The VGA BIOS post is invoked

6.3.7 APM Configuration

The **APM Configuration** menu (**BIOS Menu 11**) allows the advanced power management options to be configured.



BIOS Menu 11: Advanced Power Management Configuration

➔ Power Management/APM [Enabled]

Use the **Power Management/APM** BIOS option to enable access to the advanced power management features. If this option is disabled, the only other option on the screen is the **Power Button Mode**.

- ➔ **Disabled** Disables the Advanced Power Management (APM) feature
- ➔ **Enabled** (Default) Enables the APM feature

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→ Restore on AC Power Loss [Power Off]

Use the **Restore on AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

- **Power Off** The system remains turned off
- **Power On** (Default) The system turns on
- **Last State** The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

→ Power Button Mode [On/Off]

Use the **Power Button Mode** BIOS to specify how the power button functions.

- **On/Off** (Default) When the power button is pressed the system is either turned on or off
- **Suspend** When the power button is pressed the system goes into suspend mode

→ Resume on Ring [Disabled]

Use the **Resume on Ring** BIOS option to enable activity on the RI (ring in) modem line to rouse the system from a suspend or standby state. That is, the system will be roused by an incoming call on a modem.

- **Disabled** (Default) Wake event not generated by an incoming call
- **Enabled** Wake event generated by an incoming call

→ Resume on PME# [Disabled]

Use the **Resume on PME#** BIOS option to enable activity on the PCI PME (power management event) controller to rouse the system from a suspend or standby state.

➔ **Disabled** (Default) Wake event not generated by PCI PME controller activity

➔ **Enabled** Wake event generated by PCI PME controller activity

➔ **Resume On RTC Alarm [Disabled]**

Use the **Resume On RTC Alarm** option to specify the time the system should be roused from a suspended state.

➔ **Disabled** (Default) The real time clock (RTC) cannot generate a wake event

➔ **Enabled** If selected, the following appears with values that can be selected:

➔ **RTC Alarm Date (Days)**

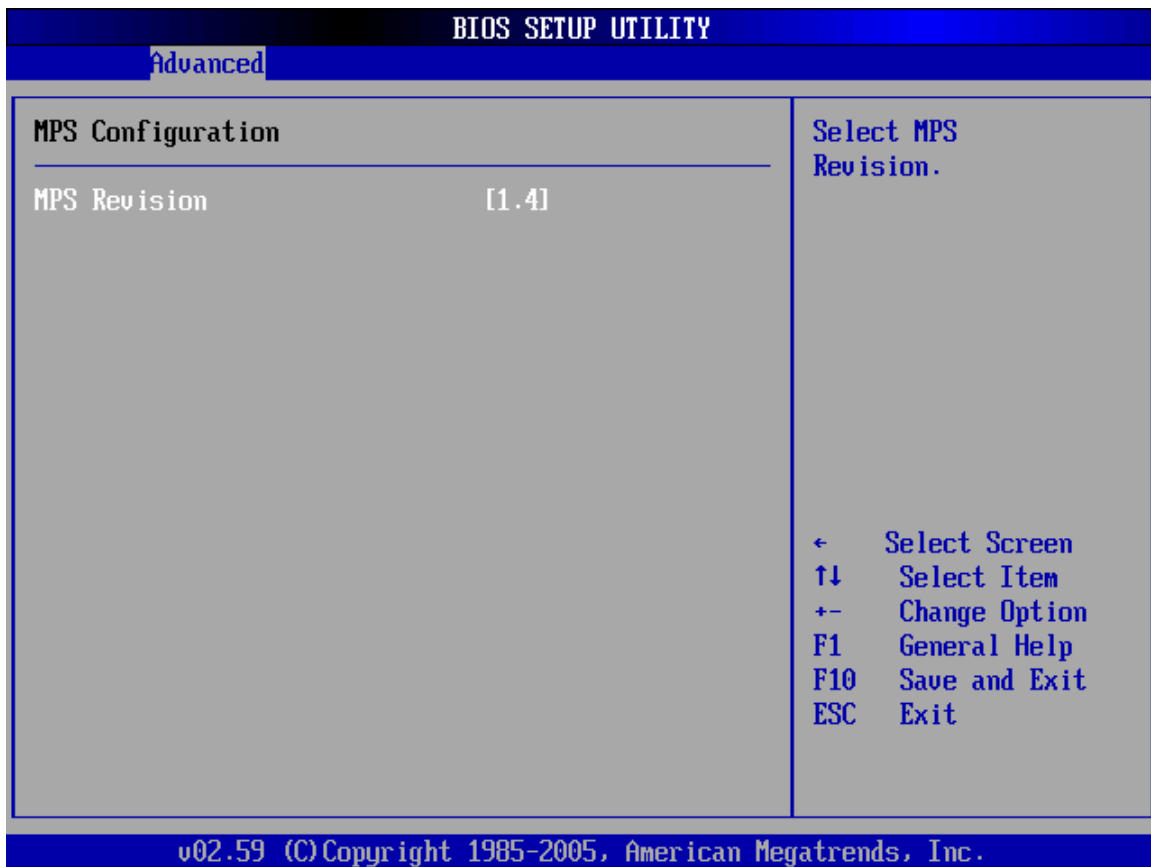
➔ **System Time**

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

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6.3.8 MPS Configuration

Use the **MPS Configuration** menu (**BIOS Menu 12**) to select the multi-processor table.



BIOS Menu 12: MPS Configuration

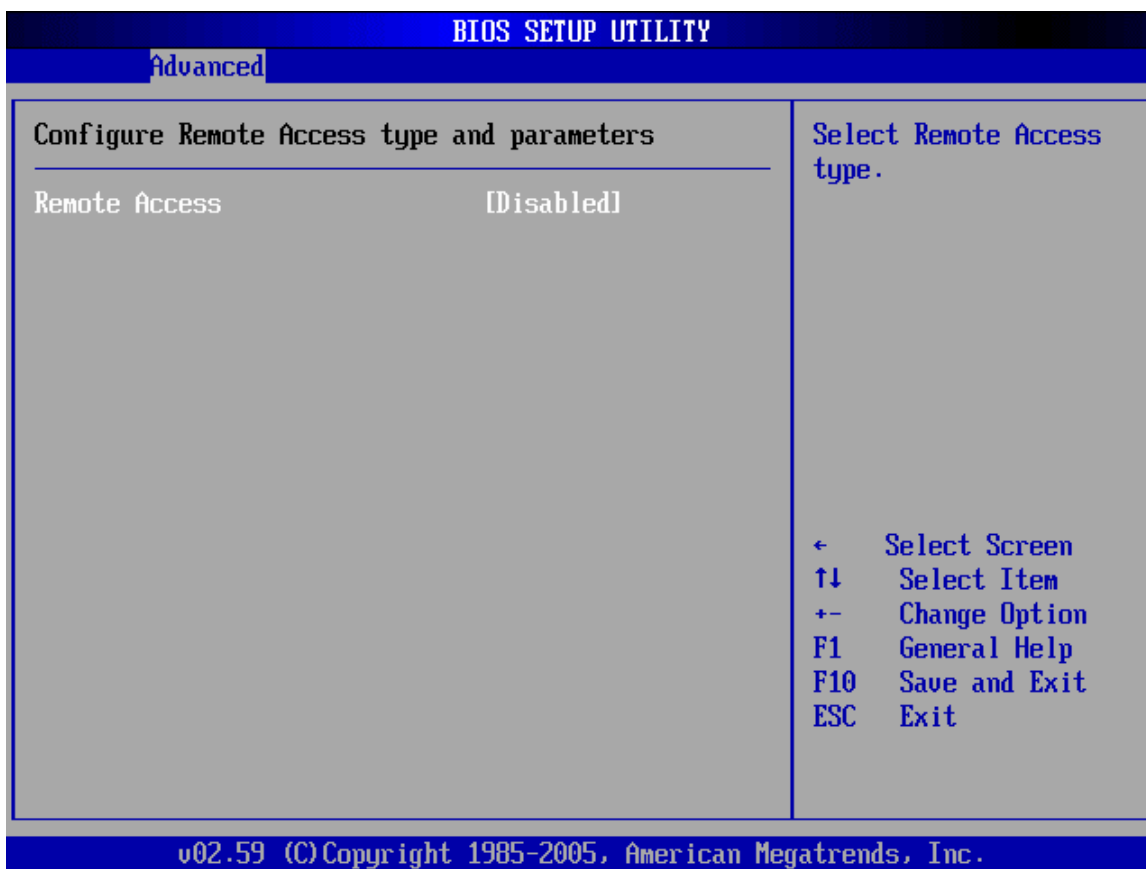
➔ **MPS Revision [1.4]**

Use the **Multiprocessor Specification (MPS) for OS** option to specify the MPS version to be used.

- ➔ **1.1** MPS version 1.1 is used
- ➔ **1.4 DEFAULT** MPS version 1.4 is used

6.3.9 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 13**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.



BIOS Menu 13: Remote Access Configuration [Advanced]

➔ Remote Access [Disabled]

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled** **DEFAULT** Remote access is disabled.

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➔ Enabled

Remote access configuration options shown below appear:

- ➔ Serial Port Number
- ➔ Serial Port Mode
- ➔ Flow Control
- ➔ Redirection after BIOS POST
- ➔ Terminal Type
- ➔ VT-UTF8 Combo Key Support

These configuration options are discussed below.

➔ Serial Port Number [COM1]

Use the **Serial Port Number** option allows to select the serial port used for remote access.

- ➔ **COM1** **DEFAULT** System is remotely accessed through COM1
- ➔ **COM2** System is remotely accessed through COM2

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

➔ Base Address, IRQ [2F8h,3]

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

➔ Serial Port Mode [115200 8,n,1]

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 **DEFAULT**
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1


NOTE:

Identical baud rate setting musts be set on the host (a management computer running a terminal software) and the slave

→ Flow Control [None]

Use the **Flow Control** option to report the flow control method for the console redirection application.

- | | | | |
|---|-----------------|----------------|--|
| → | None | DEFAULT | No control flow, |
| → | Hardware | | Hardware is set as the console redirection |
| → | Software | | Software is set as the console redirection |

→ Redirection After BIOS POST [Always]

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

- | | | | |
|---|--------------------|----------------|--|
| → | Disabled | | The console is not redirected after POST |
| → | Boot Loader | | Redirection is active during POST and during Boot Loader |
| → | Always | DEFAULT | Redirection is always active (Some Oses may not work if set to Always) |

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→ **Terminal Type [ANSI]**

Use the **Terminal Type** BIOS option to specify the remote terminal type.

- **ANSI** **DEFAULT** The target terminal type is ANSI
- **VT100** The target terminal type is VT100
- **VT-UTF8** The target terminal type is VT-UTF8

→ **VT-UTF8 Combo Key Support [Disabled]**

Use the **VT-UTF8 Combo Key Support** option to enable additional keys that are not provided by VT100 for the PC 101 keyboard.

The VT100 Terminal Definition is the standard convention used to configure and conduct emergency management tasks with UNIX-based servers. VT100 does not support all keys on the standard PC 101-key layout, however. The VT-UTF8 convention makes available additional keys that are not provided by VT100 for the PC 101 keyboard.

- **Disabled** **DEFAULT** Disables the VT-UTF8 terminal keys
- **Enabled** Enables the VT-UTF8 combination key. Support for ANSI/VT100 terminals

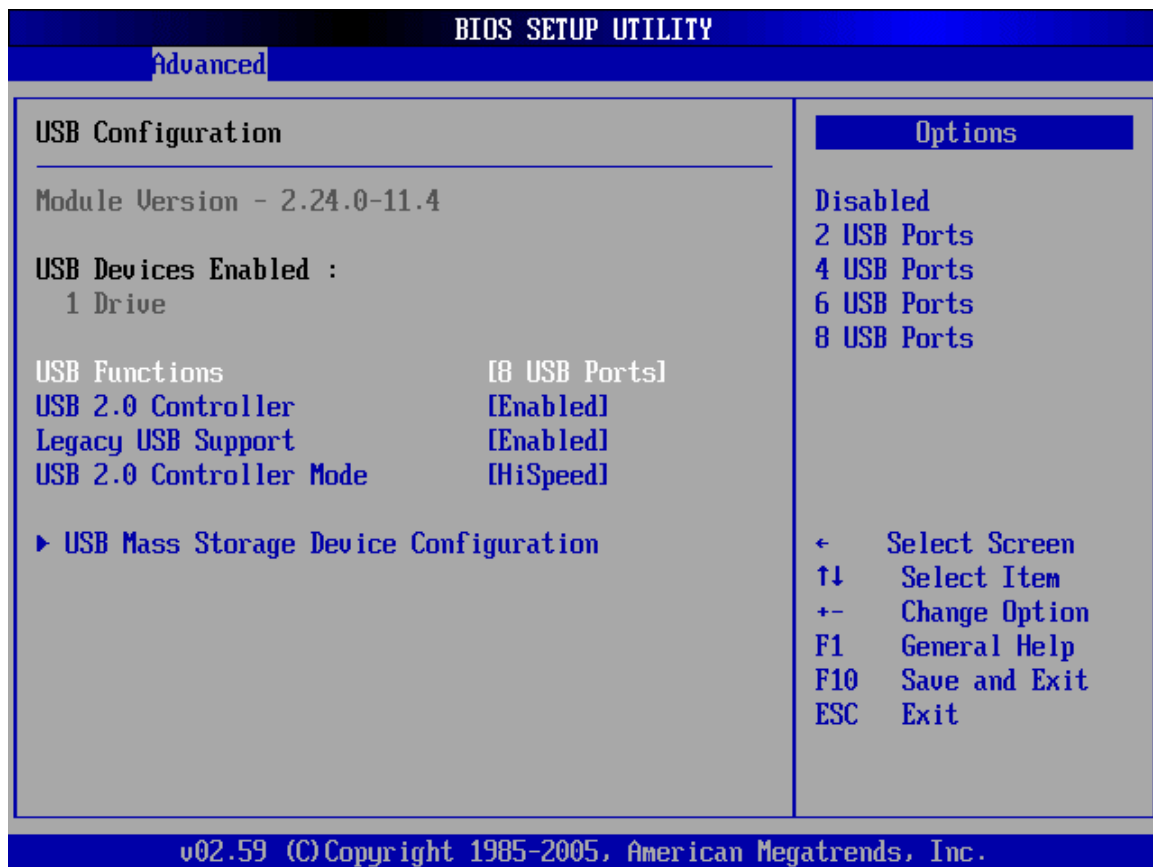
→ **Sredir Memory Display Delay [Disabled]**

Use the **Sredir Memory Display Delay** option to select the delay before memory information is displayed. Configuration options are listed below

- No Delay **DEFAULT**
- Delay 1 sec
- Delay 2 sec
- Delay 4 sec

6.3.10 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 14**) to read USB configuration information and configure the USB settings.



BIOS Menu 14: USB Configuration

➔ USB Function [8 USB ports]

Use the **USB Function** BIOS option to enable or disable a specified number of USB ports. If only two USB ports are being used, disabling the remaining six USB frees up system resources that can be redirected elsewhere.

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- ➔ **Disabled** USB function support disabled
- ➔ **2 USB Ports** Two USB ports are enabled
- ➔ **4 USB Ports** Four USB ports are enabled
- ➔ **6 USB Ports** Six USB ports are enabled
- ➔ **8 USB Ports** **DEFAULT** Eight USB ports are enabled

➔ **USB 2.0 Controller [Enabled]**

Use the **USB 2.0 Controller** BIOS option to enable or disable the USB 2.0 controller

- ➔ **Disabled** USB 2.0 controller disabled
- ➔ **Enabled** **DEFAULT** USB 2.0 controller enabled

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

- ➔ **Disabled** Legacy USB support disabled
- ➔ **Enabled** **DEFAULT** Legacy USB support enabled

➔ **USB2.0 Controller Mode [HiSpeed]**

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

- ➔ **FullSpeed** The controller is capable of operating at 12Mb/s
- ➔ **HiSpeed** **DEFAULT** The controller is capable of operating at 480Mb/s

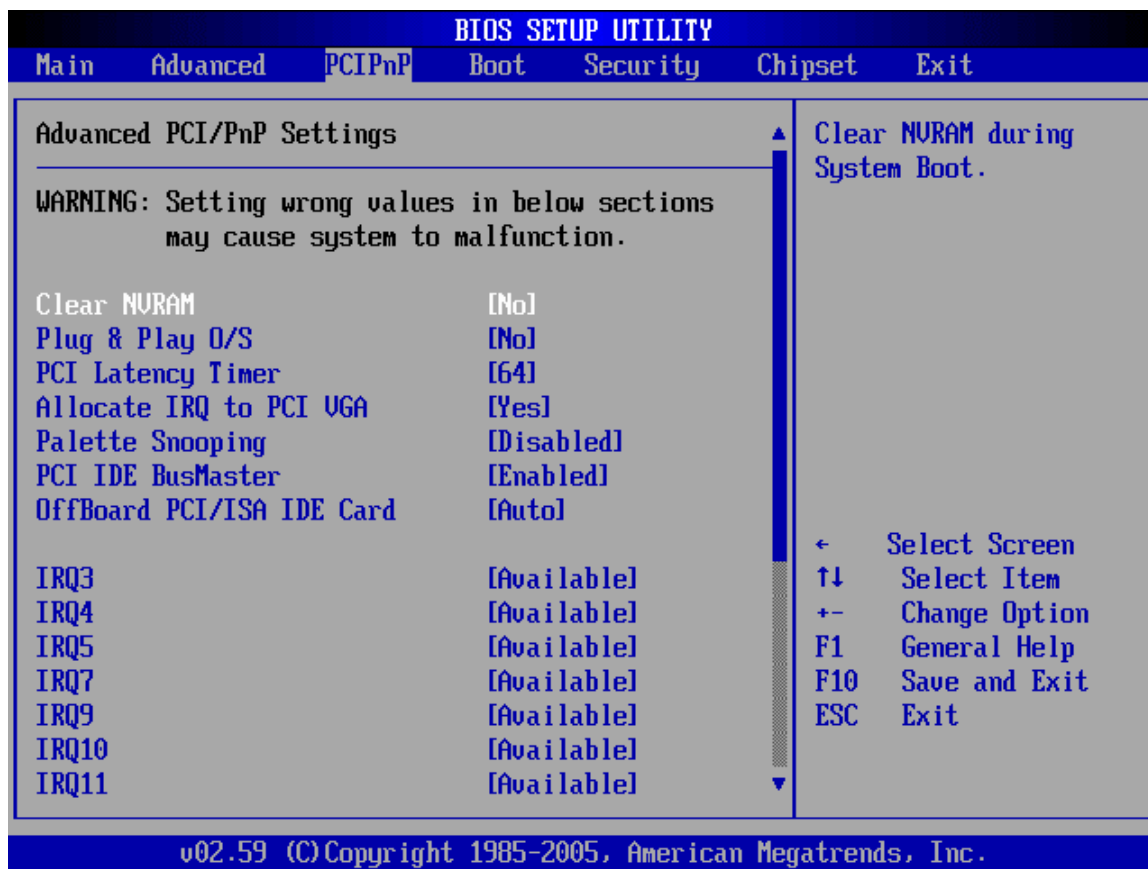
6.4 PCI/PnP

Use the **PCI/PnP** menu (**BIOS Menu 14**) to configure advanced PCI and PnP settings.

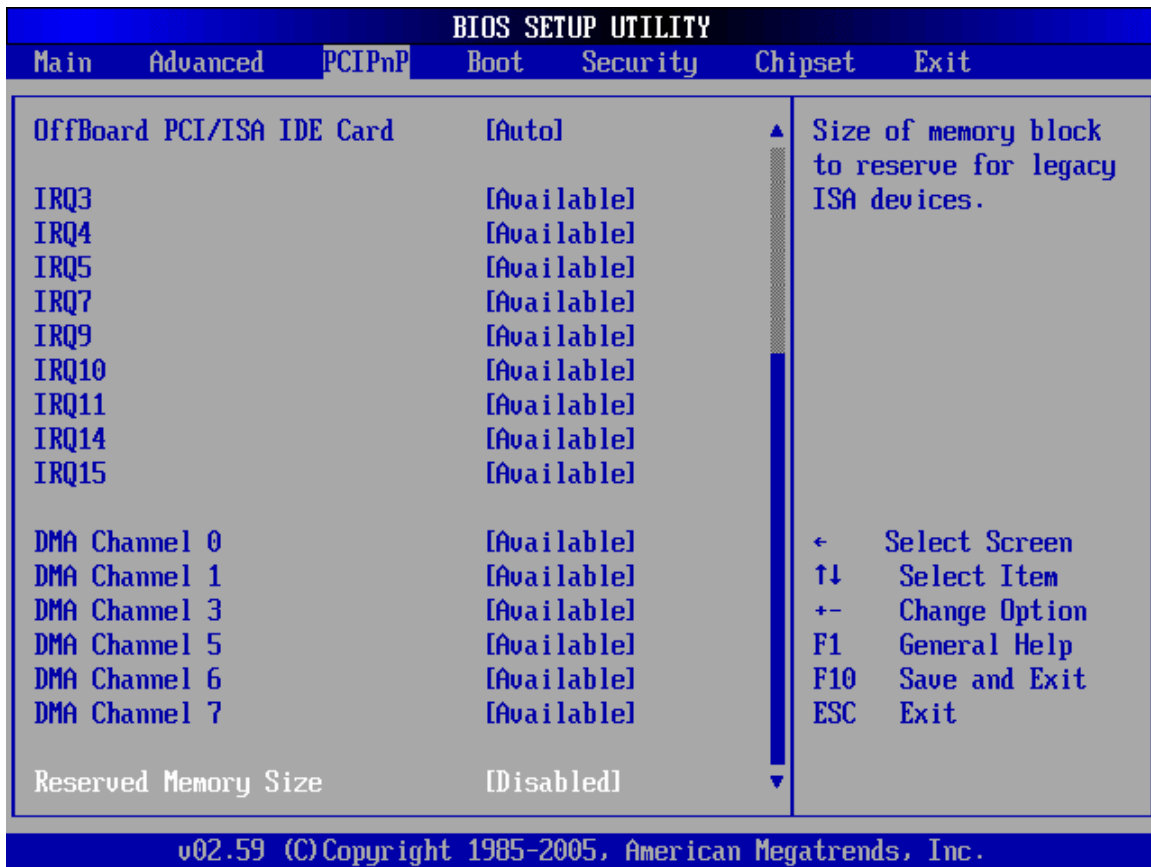


WARNING:

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.



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BIOS Menu 15: PCI/PnP Configuration

→ Clear NVRAM [No]

Use the **Clear NVRAM** option to specify if the NVRAM (Non-Volatile RAM) is cleared when the power is turned off.

→ **No** **DEFAULT** System does not clear NVRAM during system boot

→ **Yes** System clears NVRAM during system boot

→ Plug & Play O/S [No]

Use the **Plug & Play O/S** BIOS option to specify whether system plug and play devices are configured by the operating system or the BIOS.

- ➔ **No** **DEFAULT** If the operating system does not meet the Plug and Play specifications, this option allows the BIOS to configure all the devices in the system.
- ➔ **Yes** This setting allows the operating system to change the interrupt, I/O, and DMA settings. Set this option if the system is running Plug and Play aware operating systems.

➔ **PCI Latency Timer [64]**

Use the **PCI Latency Timer** option to specify the PCI latency time. The latency time is measured in units of PCI clock cycles for the PCI device latency timer register.

Configuration options are:

- 32
- 64 Default
- 96
- 128
- 160
- 192
- 224
- 248

➔ **Allocate IRQ to PCI VGA [Yes]**

Use the **Allocate IRQ to PCI VGA** option to restrict the system from giving the VGA adapter card an interrupt address.

- ➔ **Yes** (Default) Assigns an IRQ to a PCI VGA card if card requests IRQ
- ➔ **No** Does not assign IRQ to a PCI VGA card even if the card requests an IRQ

➔ **Palette Snooping [Disabled]**

Use the **Palette Snooping** option to enable or disable the palette snooping function.

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- ➔ **Disabled** **DEFAULT** Unless the VGA card manufacturer requires palette snooping to be enabled, this option should be disabled.
- ➔ **Enabled** PCI devices are informed that an ISA based Graphics device is installed in the system so the ISA based Graphics card functions correctly. This does not necessarily indicate a physical ISA adapter card. The graphics chipset can be mounted on a PCI card. Always check with the adapter card manual first, before modifying the default settings in the BIOS.

➔ **PCI IDE BusMaster [Disabled]**

Use the **PCI IDE BusMaster** BIOS option to enable or prevent PCI IDE busmastering.

- ➔ **Disabled** **DEFAULT** Busmastering is prevented
- ➔ **Enabled** IDE controller on the PCI local bus has mastering capabilities

➔ **OffBoard PCI/ISA IDE Card [Auto]**

Use the **OffBoard PCI/ISA IDE Card** BIOS option to select the **OffBoard PCI/ISA IDE Card**.

- ➔ **Auto** **DEFAULT** The location of the Off Board PCI IDE adapter card is automatically detected by the AMIBIOS.
- ➔ **PCI Slot 1** PCI Slot 1 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 1.
- ➔ **PCI Slot 2** PCI Slot 2 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the

adapter card is installed in PCI Slot 2.

➔ **PCI Slot 3**

PCI Slot 3 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 3.

➔ **PCI Slot 4**

PCI Slot 4 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 4.

➔ **PCI Slot 5**

PCI Slot 5 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 5.

➔ **PCI Slot 6**

PCI Slot 6 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 6.

➔ **IRQ# [Available]**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

➔ **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices

➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ9

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- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

→ DMA Channel# [Available]

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

- | | | | |
|---|------------------|----------------|--|
| → | Available | DEFAULT | The specified DMA is available to be used by PCI/PnP devices |
| → | Reserved | | The specified DMA is reserved for use by Legacy ISA devices |

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

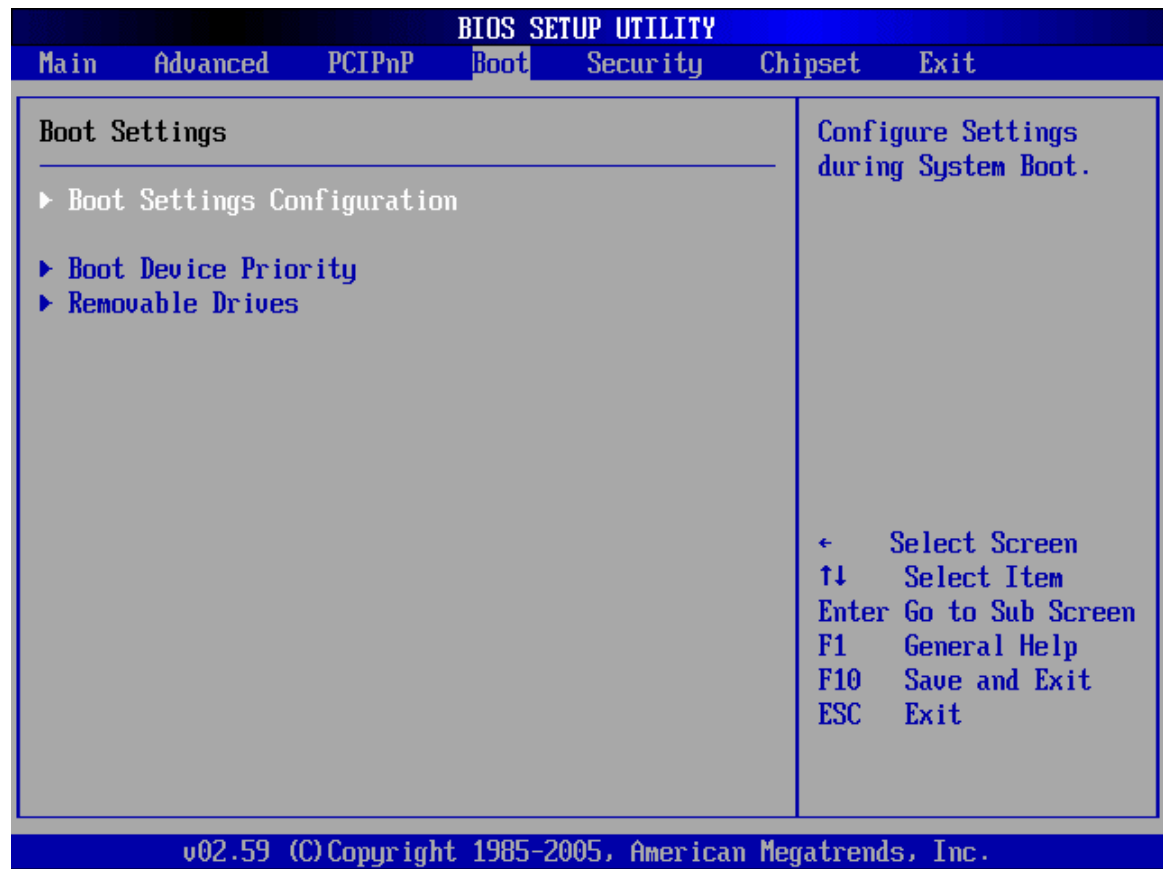
→ Reserved Memory Size [Disabled]

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

- | | | | |
|---|-----------------|----------------|---|
| → | Disabled | DEFAULT | No memory block reserved for legacy ISA devices |
| → | 16K | | 16KB reserved for legacy ISA devices |
| → | 32K | | 32KB reserved for legacy ISA devices |
| → | 64K | | 54KB reserved for legacy ISA devices |

6.5 Boot

Use the **Boot** menu (**BIOS Menu 16**) to configure system boot options.

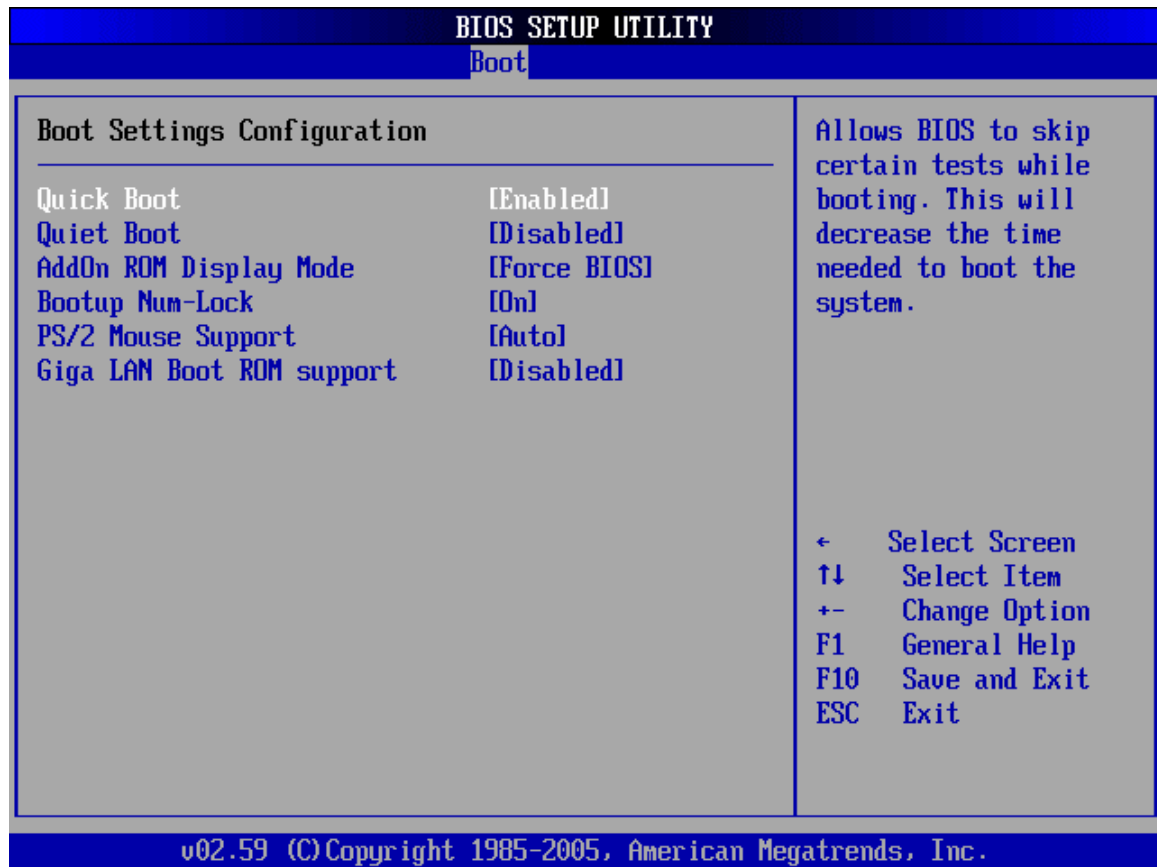


BIOS Menu 16: Boot

6.5.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (**BIOS Menu 16**) to configure advanced system boot options.

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BIOS Menu 17: Boot Settings Configuration

→ Quick Boot [Enabled]

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

- **Disabled** No POST procedures are skipped
- **Enabled** **DEFAULT** Some POST procedures are skipped to decrease the system boot time

→ Quiet Boot [Disabled]

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

- **Disabled** **DEFAULT** Normal POST messages displayed

➔ **Enabled** OEM Logo displayed instead of POST messages

➔ **AddOn ROM Display Mode [Force BIOS]**

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS** **DEFAULT** The system forces third party BIOS to display during system boot.

➔ **Keep Current** The system displays normal information during system boot.

➔ **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **PS/2 Mouse Support [Enabled]**

Use the **PS/2 Mouse Support** option adjusts PS/2 mouse support capabilities.

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- ➔ **Disabled** PS/2 mouse support is disabled and prevented from using system resources.
- ➔ **Enabled** **DEFAULT** Allows the system to use a PS/2 mouse.
- ➔ **Auto** The system auto-adjusts PS/2 mouse support.

➔ **Giga LAN Boot Support [Disabled]**

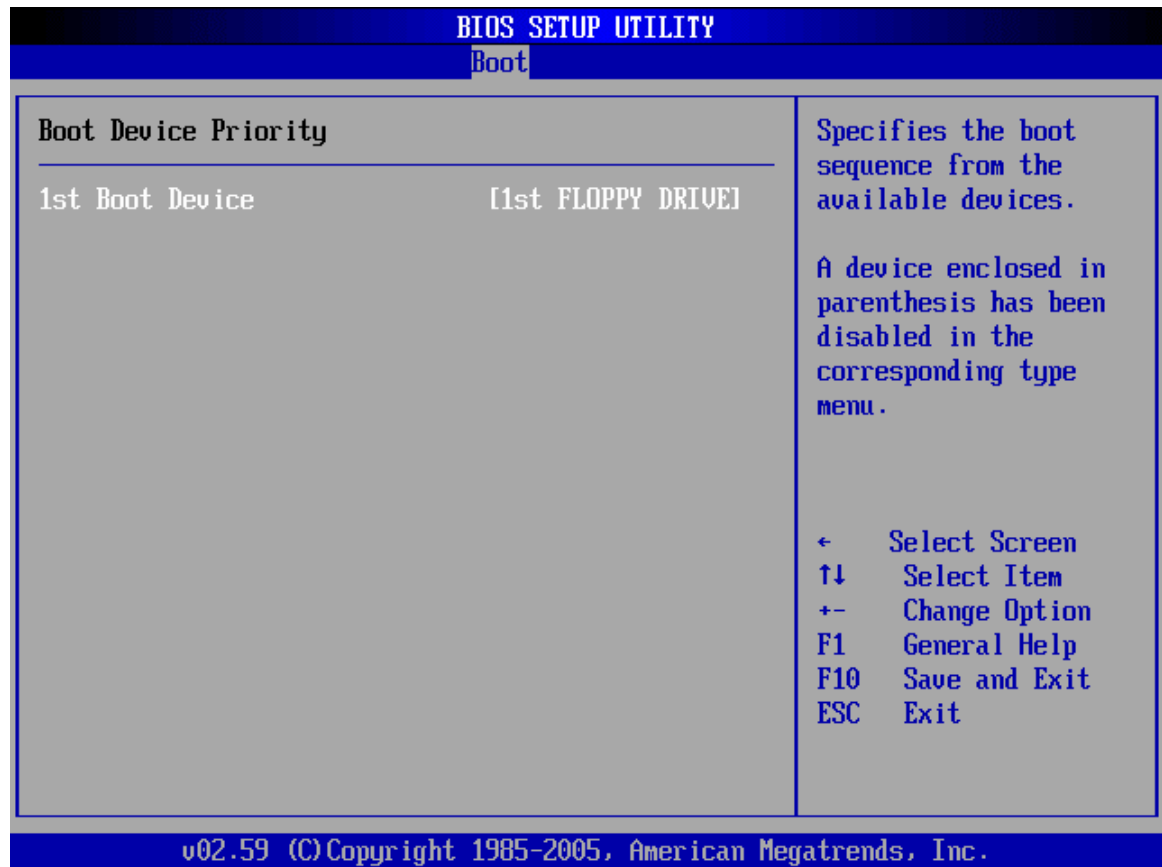
Use the **Giga LAN Boot Support** option to enable the system to be booted from a remote system.

- ➔ **Disabled** (Default) Cannot be booted from a remote system through the LAN
- ➔ **Enabled** (Default) Can be booted from a remote system through the LAN

6.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 18**) to specify the boot sequence from the available devices. Possible boot devices may include:

- 1st FLOPPY DRIVE
- HDD
- CD/DVD



BIOS Menu 18: Boot Device Priority Settings

6.5.3 Hard Disk Drives

Use the **Hard Disk Drives** menu to specify the boot sequence of the available HDDs.

When the menu is opened, the HDDs connected to the system are listed as shown below:

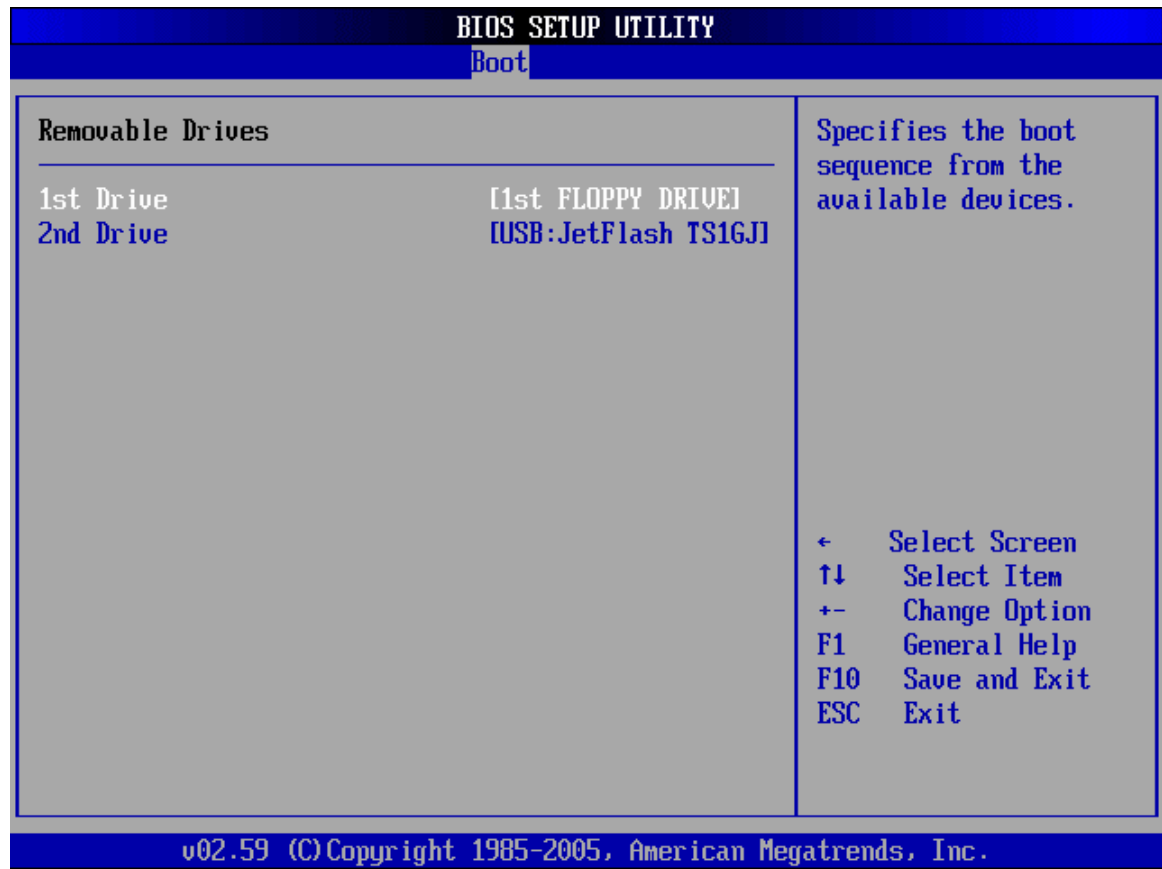
- 1st Drive [HDD: PM-(part number)]
- 2nd Drive [HDD: PS-(part number)]
- 3rd Drive [HDD: SM-(part number)]
- 4th Drive [HDD: SM-(part number)]



NOTE:

Only the drives connected to the system are shown. For example, if only two HDDs are connected only **“1st Drive”** and **“2nd Drive”** are listed.

The boot sequence from the available devices is selected. If the **“1st Drive”** option is selected a list of available HDDs is shown. Select the first HDD the system boots from. If the **“1st Drive”** is not used for booting this option may be disabled.



BIOS Menu 19: Hard Disk Drives

6.5.4 Removable Drives

Use the **Removable Drives** menu (**BIOS Menu 20**) to specify the boot sequence of the available FDDs. When the menu is opened, the FDDs connected to the system are listed as shown below:

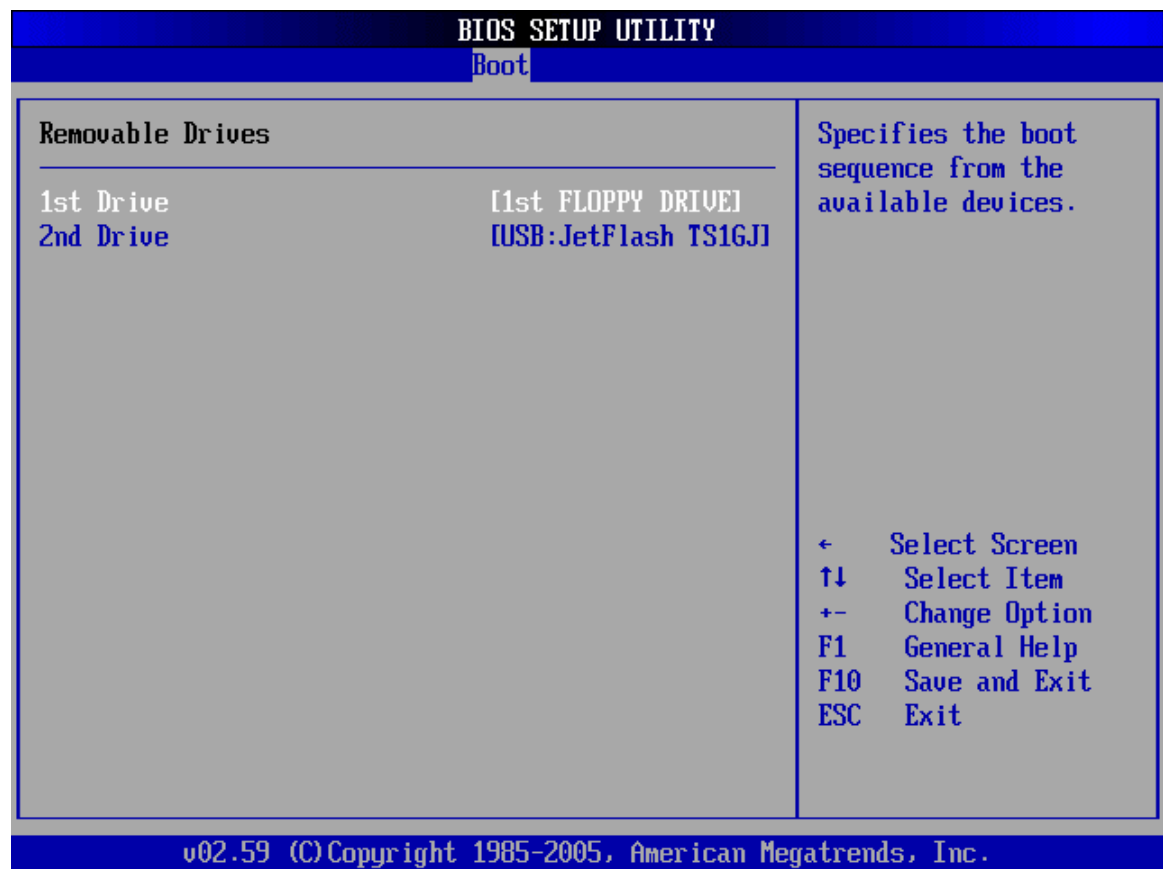
- 1st Drive [1st FLOPPY DRIVE]
- 2nd Drive [2nd FLOPPY DRIVE]

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**NOTE:**

Only the drives connected to the system are shown. For example, if only one FDD is connected only “**1st Drive**” is listed.

The boot sequence from the available devices is selected. If the “**1st Drive**” option is selected a list of available FDDs is shown. Select the first FDD the system boots from. If the “**1st Drive**” is not used for booting this option may be disabled.



BIOS Menu 20: Removable Drives

6.5.5 CD/DVD Drives

Use the **CD/DVD Drives** menu to specify the boot sequence of the available CD/DVD drives. When the menu is opened, the CD drives and DVD drives connected to the system are listed as shown below:

- 1st Drive [CD/DVD: PM-(part ID)]
- 2nd Drive [HDD: PS-(part ID)]
- 3rd Drive [HDD: SM-(part ID)]
- 4th Drive [HDD: SM-(part ID)]



NOTE:

Only the drives connected to the system are shown. For example, if only two CDs or DVDs are connected only **“1st Drive”** and **“2nd Drive”** are listed.

The boot sequence from the available devices is selected. If the **“1st Drive”** option is selected a list of available CD/DVD drives is shown. Select the first CD/DVD drive the system boots from. If the **“1st Drive”** is not used for booting this option may be disabled.

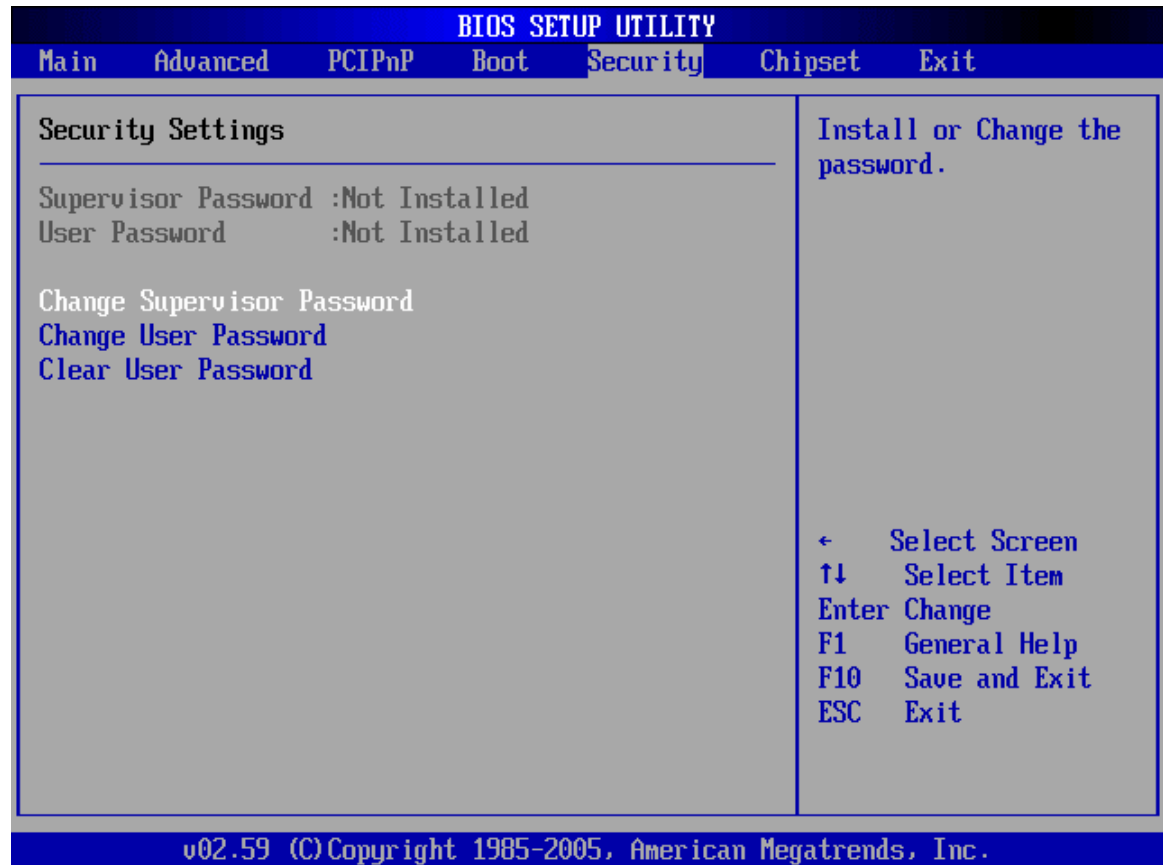
PCIE-9452 PICMG 1.3 CPU Card

BIOS SETUP UTILITY	
Boot	
CD/DVD Drives	Specifies the boot sequence from the available devices.
1st Drive	[CD/DVD:PS-SONY CD-]
<div> ↔ Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit </div>	
v02.56 (C) Copyright 1985-2004, American Megatrends, Inc.	

BIOS Menu 21: CD/DVD Drives

6.6 Security

Use the **Security** menu (**BIOS Menu 22**) to set system and user passwords.



BIOS Menu 22: Security

➔ Change Supervisor Password

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

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→ Change User Password

Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

6.7 Chipset

Use the **Chipset** menu (**BIOS Menu 23**) to access the NorthBridge and SouthBridge configuration menus.



WARNING:

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

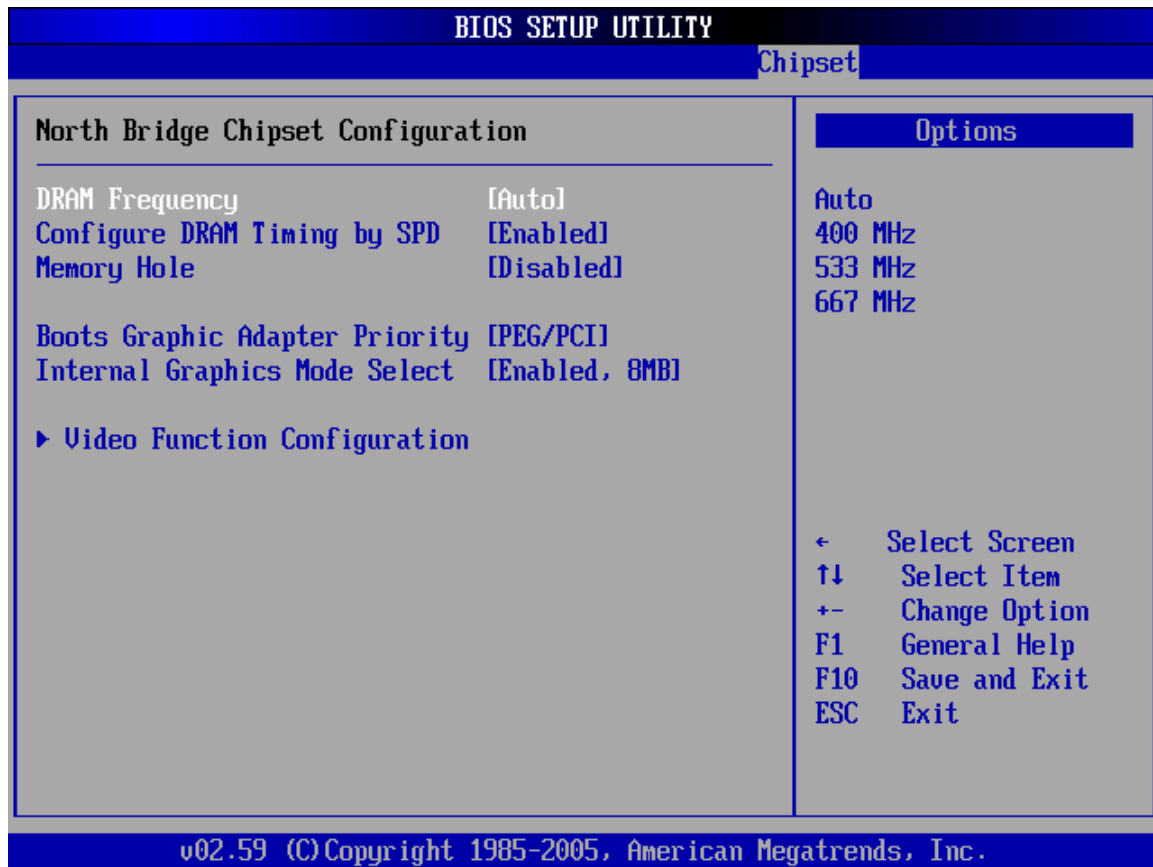


BIOS Menu 23: Chipset

6.7.1 NorthBridge Configuration

Use the **NorthBridge Configuration** menu (**BIOS Menu 23**) to configure the northbridge chipset.

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BIOS Menu 24:NorthBridge Chipset Configuration

→ DRAM Frequency [Auto]

Use the **DRAM Frequency** option to specify the DRAM frequency or allow the system to automatically detect the DRAM frequency.

- **400MHz** Sets the DRAM frequency to 400MHz
- **533MHz** Sets the DRAM frequency to 533MHz
- **667MHz** Sets the DRAM frequency to 667MHz
- **Auto** **DEFAULT** Automatically selects the DRAM frequency

→ **Configure DRAM Timing by SPD [Enabled]**

Use the **Configure DRAM Timing by SPD** option to determine if the system uses the SPD (Serial Presence Detect) EEPROM to configure the DRAM timing. The SPD EEPROM contains all necessary DIMM specifications including the speed of the individual components such as CAS and bank cycle time as well as valid settings for the module and the manufacturer's code. The SPD enables the BIOS to read the spec sheet of the DIMMs on boot-up and then adjust the memory timing parameters accordingly.

- **Disabled** DRAM timing parameters are manually set using the
DRAM sub-items
- **Enabled DEFAULT** DRAM timing parameter are set according to the
DRAM Serial Presence Detect (SPD)

If the **Configure DRAM Timing by SPD** option is disabled, the following configuration options appear.

- DRAM CAS# Latency [3]
- DRAM RAS# to CAS# Delay [5 DRAM Clocks]
- DRAM RAS# Precharge [5 DRAM Clocks]
- DRAM RAS# Activate to Precha [15 DRAM Clocks]

→ **DRAM CAS# Latency [5]**

Use the **CAS Latency Time** configuration option to set the Column Address Strobe (CAS) delay time. (To be able to change this configuration option the **DRAM Latency Timing** configuration option must be set to "**Manual**") The following configuration options are available

- 5 nanoseconds
- 4 nanoseconds
- 3 nanoseconds **DEFAULT**

→ DRAM RAS# to CAS# Delay [6 DRAM Clocks]

Use the **DRAM RAS# to CAS# Delay** option to specify the number of clock cycles must elapse between sending a RAS (row address strobe) signal and the CAS (column address strobe) signal. A pause is required between the RAS signal and the CAS signal to ensure the memory is correctly addressed. (To be able to change this configuration option the **Configure DRAM Timing by SPD** configuration option must be set to “**Disabled**”)

Configuration options are listed below:

- 2 DRAM Clocks
- 3 DRAM Clocks
- 4 DRAM Clocks
- 5 DRAM Clocks
- 6 DRAM Clocks **DEFAULT**
- 7 DRAM Clocks

→ DRAM RAS# Precharge [6 DRAM Clocks]

Use the **DRAM RAS# Precharge** option to set the speed at which the RAM terminates the access of one row and start accessing another. (To be able to change this configuration option the **DRAM RAS# Precharge** configuration option must be set to “**Manual**”) The following configuration options are available

- 2 DRAM Clocks
- 3 DRAM Clocks
- 4 DRAM Clocks
- 5 DRAM Clocks
- 6 DRAM Clocks **DEFAULT**
- 7 DRAM Clocks

→ DRAM RAS# Activate to Precha [15 DRAM Clocks]

Use the **DRAM RAS# Activate to Precha** option to specify the length of the delay between the activation and precharge commands for the RAS signal. That is how long after activation can the access cycle be started again. This influences row activation time

that is considered when memory has hit the last column in a specific row, or when an entirely different memory location is requested. (To be able to change this configuration option the **Configure DRAM Timing by SPD** configuration option must be set to **"Disabled"**) The following configuration options are available:

- 4 DRAM Clocks
- 5 DRAM Clocks
- 6 DRAM Clocks
- 7 DRAM Clocks
- 8 DRAM Clocks
- 9 DRAM Clocks
- 10 DRAM Clocks
- 11 DRAM Clocks
- 12 DRAM Clocks
- 13 DRAM Clocks
- 14 DRAM Clocks
- 15 DRAM Clocks **DEFAULT**

➔ **Memory Hole [Disabled]**

Use the **Memory Hole** option to reserve memory space between 15MB and 16MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

- | | | | |
|---|--------------------|----------------|---|
| ➔ | Disabled | DEFAULT | Memory is not reserved for ISA expansion cards |
| ➔ | 15MB – 16MB | | Between 15MB and 16MB of memory is reserved for ISA expansion cards |

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→ Boots Graphics Adapter [PEG/PCI]

Use the **Boots Graphics Adapter** option to select the graphics controller used as the primary boot device. Select either an integrated graphics controller (IGD) or a combination of PCI graphics controller, a PCI express (PEG) controller or an IGD. Configuration options are listed below:

- IGD
- PCI/IGD
- PCI/PEG
- PEG/IGD
- PEG/PCI **DEFAULT**

→ Internal Graphics Mode Select [Enable, 8MB]

Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the Internal graphics device.

- **Disable**
- **Enable, 1MB** 1MB of memory used by internal graphics device
- **Enable, 8MB** **DEFAULT** 8MB of memory used by internal graphics device

6.7.1.1 Video Function Configuration

Use the **Video Function Configuration** menu to configure the video device connected to the system.

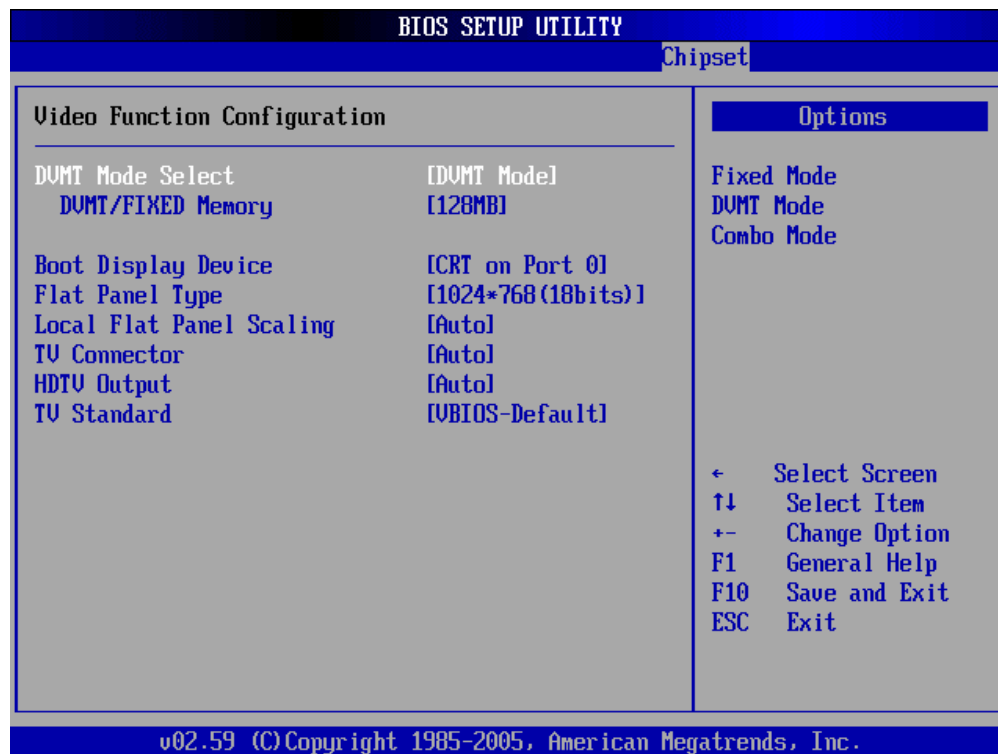


Figure 6-1: Video Function Configuration

➔ **DVMT Mode Select [DVMT Mode]**

Use the **DVMT Mode Select** option to select the Intel Dynamic Video Memory Technology (DVMT) operating mode.

- ➔ **Fixed Mode** A fixed portion of graphics memory is reserved as graphics memory.
- ➔ **DVMT Mode DEFAULT** Graphics memory is dynamically allocated according to the system and graphics needs.
- ➔ **Combo Mode** A fixed portion of graphics memory is reserved as graphics memory. If more memory is needed, graphics memory is dynamically allocated according to the system and graphics needs.

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→ DVMT/FIXED Memory

Use the **DVMT/FIXED Memory** option to specify the maximum amount of memory that can be allocated as graphics memory. This option can only be configured for if **DVMT Mode** or **Fixed Mode** is selected in the **DVMT Mode Select** option. If **Combo Mode** is selected, the maximum amount of graphics memory is 128MB. Configuration options are listed below.

- 64MB
- 128MB Default
- Maximum DVMT

→ Boot Display Device

Use the **Boot Display Device** option to select the display device used by the system when it boots. Configuration options are listed below.

- CRT on Port 0 **DEFAULT**
- CRT and DFP
- CRT and LCD

→ Flat Panel Type [Type 1]

Use the **Flat Panel Type** option to select the type of flat panel connected to the system. Configuration options are listed below.

- 640*480(18bits)
- 800*600(18bits)
- 1024*678(18bits)
- 1280*1024(36bits)
- 1400*1050(36bits)
- 1600*1200(36bits)
- 1280*1024(48bits)
- 1680*1050(36bits)
- 1920*1200(36bits)
- 1024*768(48bits)
- 1440*900(36bits)

- 1440*900(48bits)
- 1280*800(18bits)
- 1280*600(18bits)
- 2048*1536(36bits)

→ **Local Flat Panel Scaling [Auto]**

Use the **Local Flat Panel Scaling** option to select the method of scaling for the flat panel screen attached to the system.

- | | | | |
|---|-----------------------|----------------|----------------------|
| → | Auto | DEFAULT | Scaling is automatic |
| → | Forced Scaling | | Scaling is forced |
| → | Disabled | | Scaling is disabled |

→ **TV Connector [Auto]**

Use the **TC Connector** option to select the connector that is used to connect the system to the television. The configuration options are listed below.

- | | | |
|---|-----------------------|----------------|
| ■ | Auto | DEFAULT |
| ■ | Composite | |
| ■ | Component | |
| ■ | Composite & RGB | |
| ■ | S-Video | |
| ■ | SCART Composite | |
| ■ | SCART Compos. & RGB | |
| ■ | SCART Compos. & S-Vdo | |
| ■ | SMPTE253 Compon. RGB | |

→ **HDTV Output [Auto]**

Use the **HDTV Output** option to select the number of vertical lines in each frame, the method the HDTV connected to the system scans and the frequency of the frames.

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The two scanning types can be selected interlaced (i) or progressive (p). Interlaced scanning divides and presents each video frame as two fields. The first field presents the odd lines and the second field presents the even lines. In progressive scanning, the image is refreshed from top to bottom, one line after the other.

Configuration options are listed below:

Option	Scan Type	Vertical Lines	Frame Frequency
Auto	Auto	Auto	Auto
480i60	Interlaced	240 per field (480 per frame)	60 frames per second
480p60	Progressive	480 per frame	60 frames per second
576i50	Interlaced	283 per field (576 per frame)	50 frames per second
576p50	Progressive	576 per frame	50 frames per second
720p60	Progressive	720 per frame	60 frames per second
1080i50	Interlaced	540 per field (1080 per frame)	50 frames per second
1080i60	Interlaced	540 per field (1080 per frame)	60 frames per second
1080p24	Progressive	1080 per frame	24 frames per second
1080p25	Progressive	1080 per frame	25 frames per second
1080p30	Progressive	1080 per frame	30 frames per second
1080p50	Progressive	1080 per frame	50 frames per second
1080p60	Progressive	1080 per frame	60 frames per second

→ TV Standard [Auto]

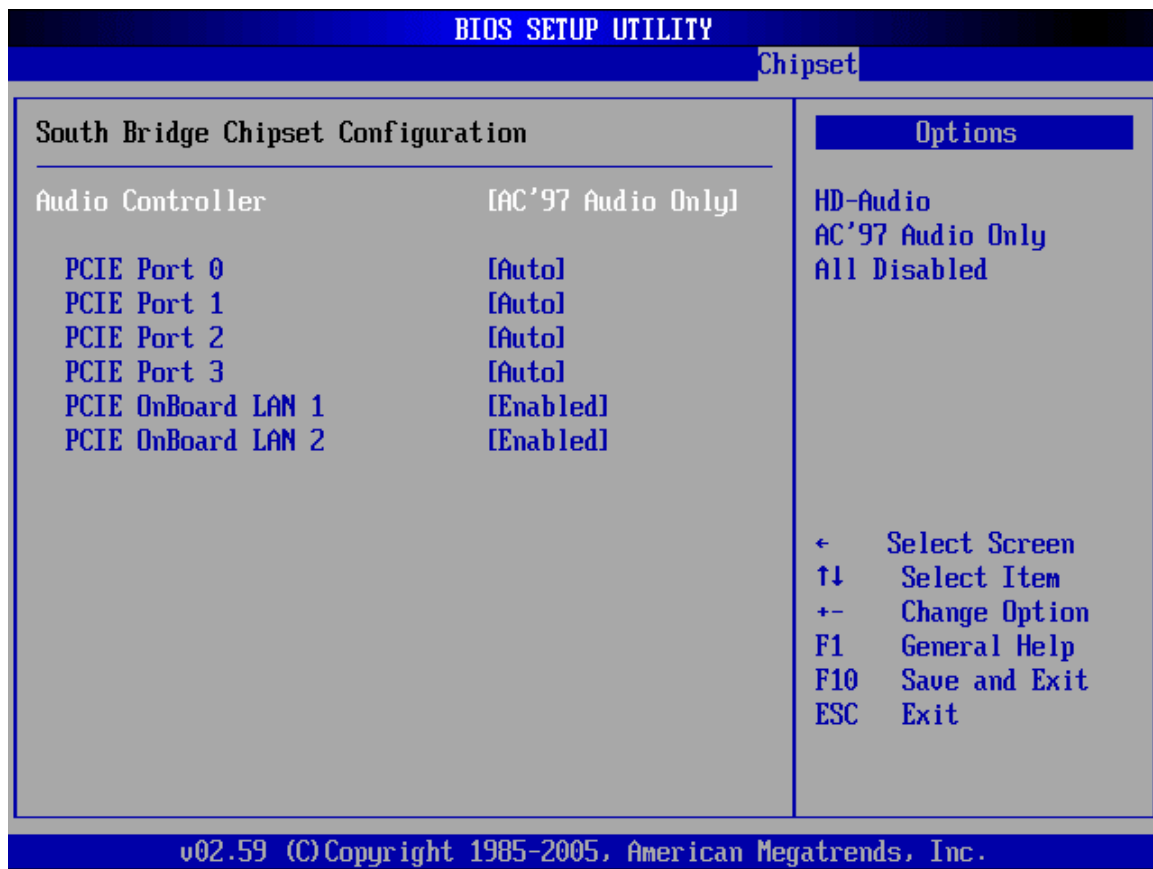
Use the **TV Standard** option to select the standard of the television connected to the system. The configuration options are listed below.

- VBIOS-Default **DEFAULT**
- NTSC
- PAL
- SECAM
- SMPTE295M
- ITU-R television
- SMPTE295M
- SMPTE296M

- ETA-770.2
- ETA-770.3

6.7.2 SouthBridge Chipset Configuration

The **SouthBridge Chipset Configuration** menu (**BIOS Menu 25**) the southbridge chipset to be configured.



BIOS Menu 25:SouthBridge Chipset Configuration

➔ Audio Controller [AC'97 Audio]

The **Audio Controller** option allows selection of the audio controller to use.

➔ **Azalia** **DEFAULT** The Intel® High Definition Audio controller is enabled

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- **AC'97 Audio** The on-board AC'97 controller is enabled
- **All Disabled** All audio controllers are disabled

→ **PCIE Port n [Enabled]**

Use the **PCIE Port n** option to determine enable or disable the nth PCIe port.

- **Auto** **DEFAULT** nth PCI Express port is detected automatically
- **Disabled** nth PCI Express port disabled.
- **Enabled** nth PCI Express port enabled.

→ **OnBoard LAN1 [Auto]**

The **OnBoard LAN1** option enables or disables the on-board LAN1.

- **Auto** **DEFAULT** The on-board LAN1 controller is automatically detected and enabled
- **Enabled** The on-board LAN1 controller is manually enabled
- **Disabled** The on-board LAN1 controller is manually disabled

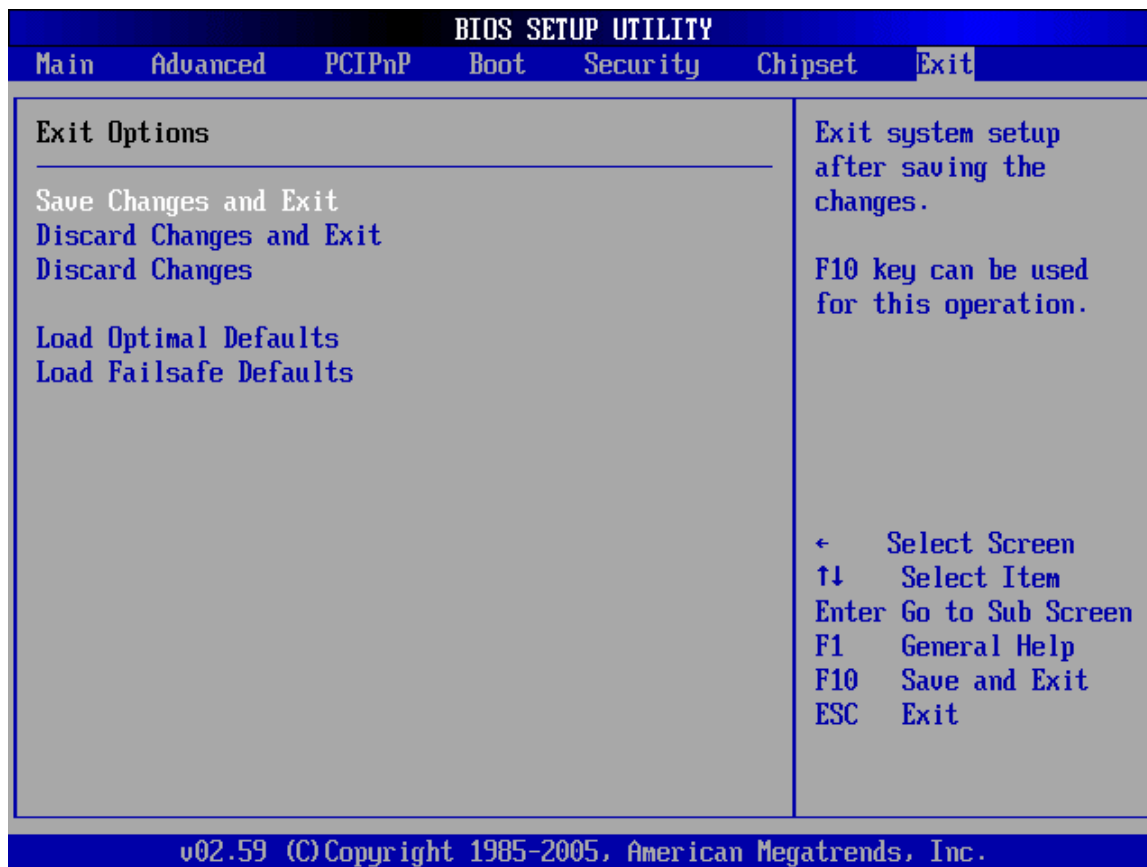
→ **On-board LAN2 [Auto]**

The **On-board LAN2** option enables or disables the on-board LAN2.

- **Auto** **DEFAULT** The on-board LAN2 controller is automatically detected and enabled
- **Enabled** The on-board LAN2 controller is manually enabled
- **Disabled** The on-board LAN2 controller is manually disabled

6.8 Exit

Use the **Exit** menu (**BIOS Menu 26**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 26:Exit

➔ Save Changes and Exit

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ Discard Changes and Exit

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

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→ Discard Changes

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

→ Load Optimal Defaults

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

→ Load Failsafe Defaults

Use the Load Failsafe Defaults option to load failsafe default values for each of the parameters on the Setup menus. F8 key can be used for this operation.



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Chapter

7

Driver Installation

7.1 Available Software Drivers



NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. You may visit the IEI website or contact technical support for the latest updates.

The following drivers can be installed on the system.

- Chipset driver
- VGA driver
- LAN driver

Installation instructions are given below.

7.2 Driver CD Auto-run

All the drivers for the PCIE-9452 are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

Step 2: The starts up automatically

Step 3: Select PCIE-9452 from the initial menu shown in **Figure 7-1**.

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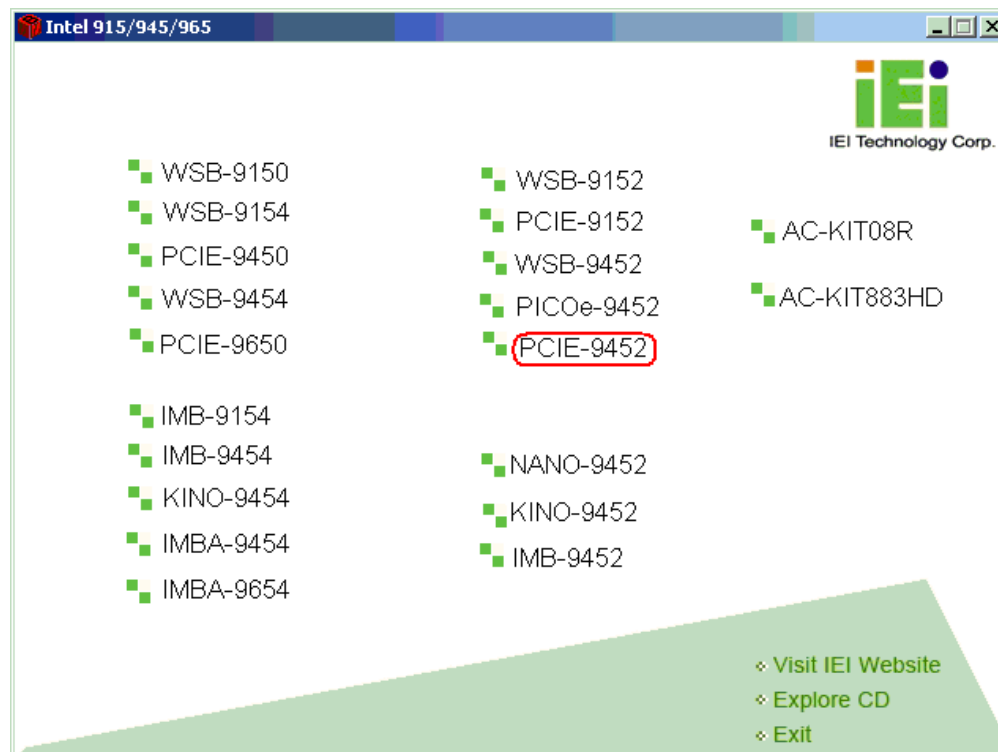


Figure 7-1: Introduction Screen

Step 4: A new screen with a list of available drivers appears (**Figure 7-2**).

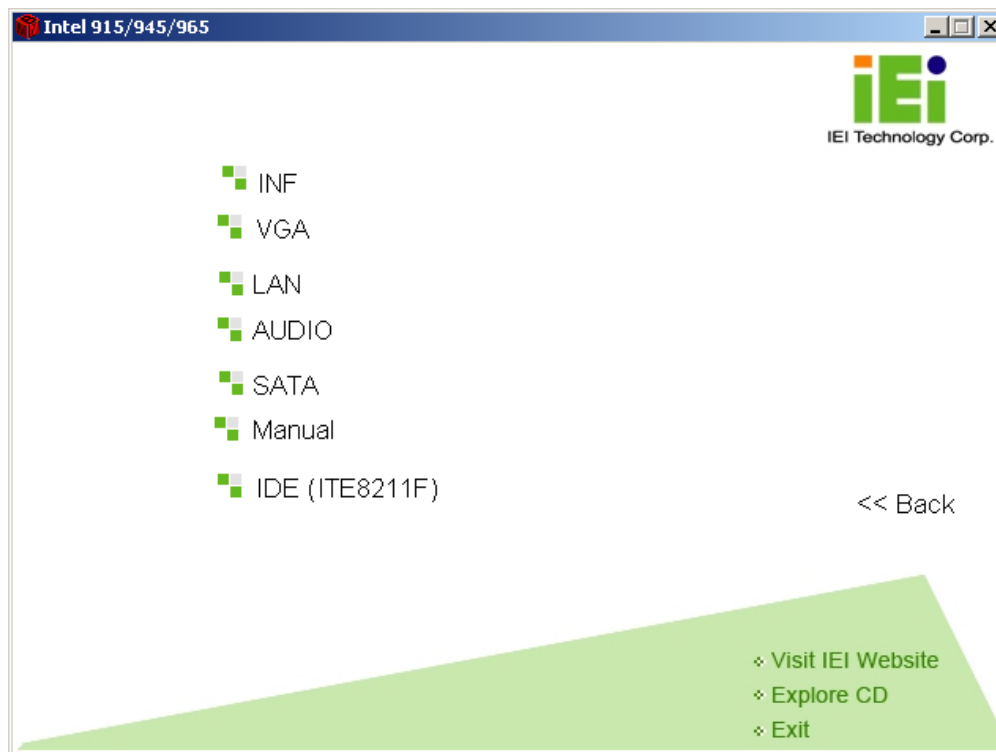


Figure 7-2: Available Drivers

Step 5: Select the driver to install from the list in **Figure 7-2**.

7.3 Chipset Driver Installation

To install the chipset driver, please follow the steps below:

Step 1: Select the INF driver from the list in **Figure 7-2**.

Step 2: A new window opens (**Figure 7-3**).

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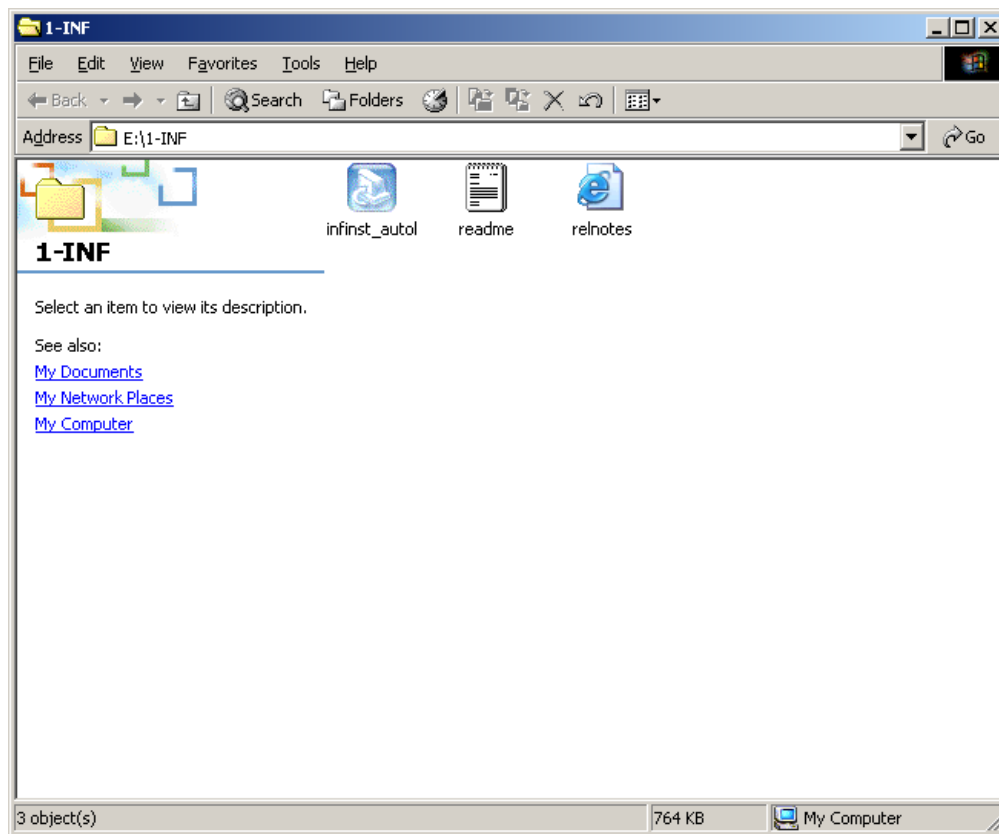


Figure 7-3: Chipset Driver Installation Program

Step 3: Double click the infinst_Autol icon in **Figure 7-3**.

Step 4: The welcome screen in **Figure 7-4** appears.

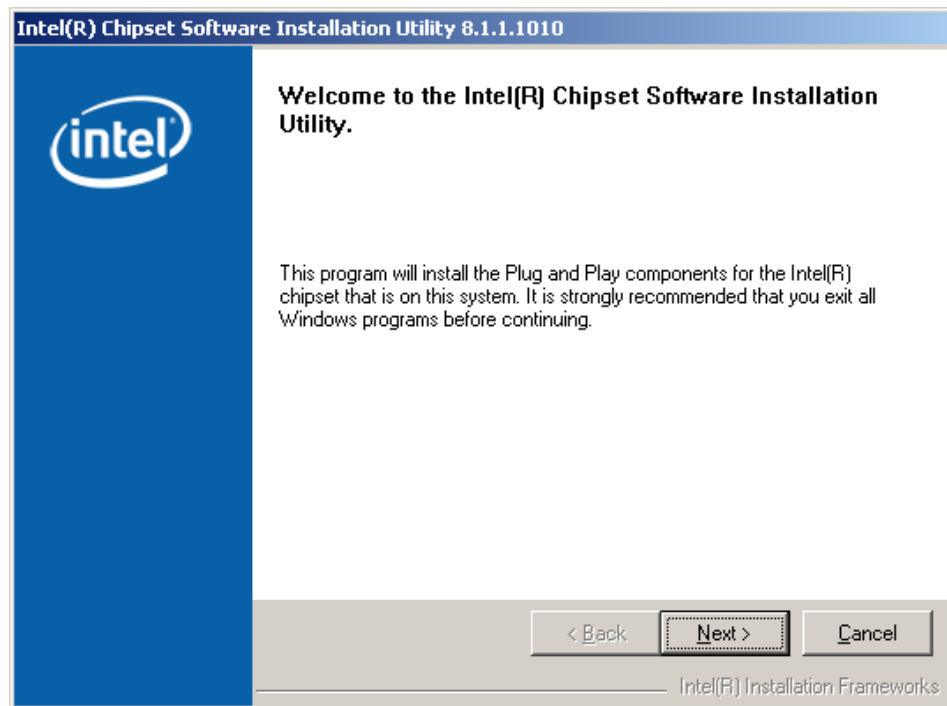


Figure 7-4: Chipset Driver Installation Welcome Screen

- Step 5:** Click **NEXT** in **Figure 7-4** to continue the installation process.
- Step 6:** The license agreement in **Figure 7-5** appears.

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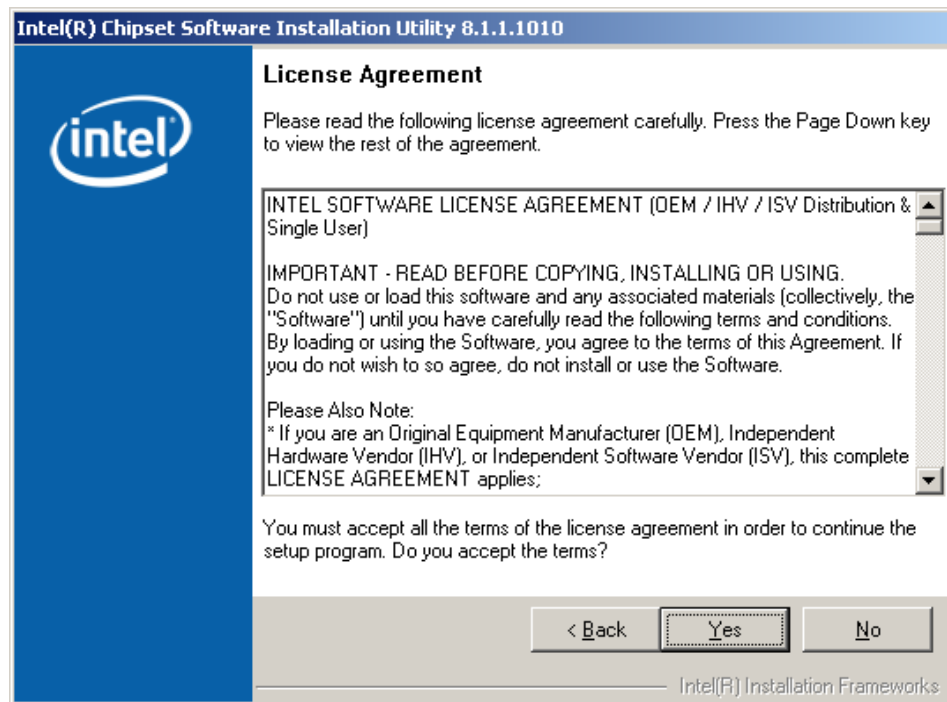


Figure 7-5: Chipset Driver Installation License Agreement

Step 7: Click **YES** to continue the setup.

Step 8: The Readme file in **Figure 7-6** appears.

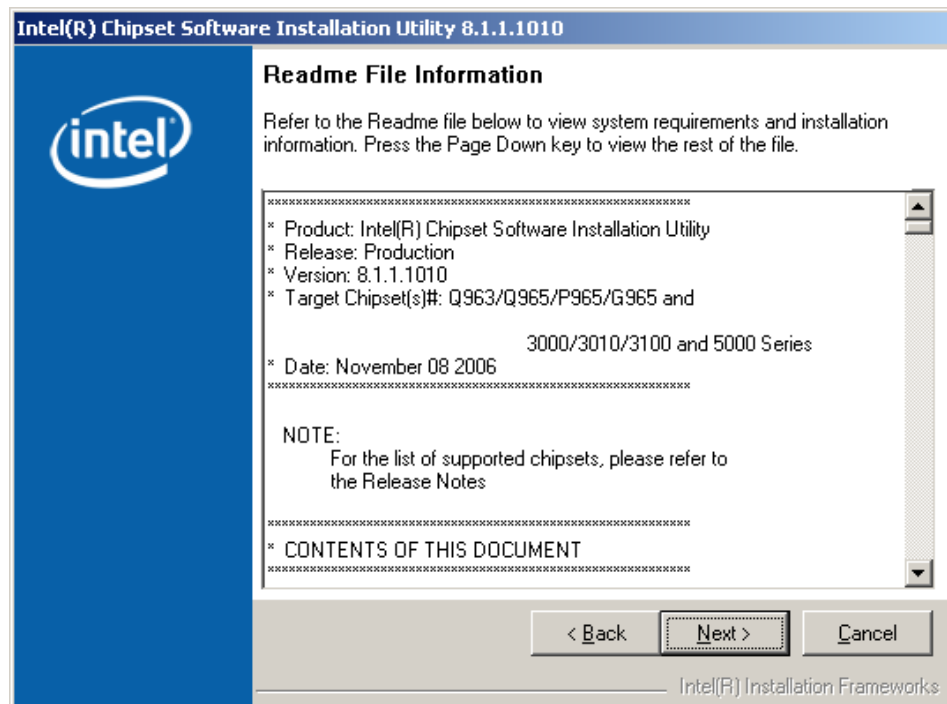


Figure 7-6: Chipset Driver Readme File Information

Step 9: Click **NEXT** in **Figure 7-6** to start the driver installation.

Step 10: After the driver installation process is complete, a confirmation screen (**Figure 7-7**) appears.

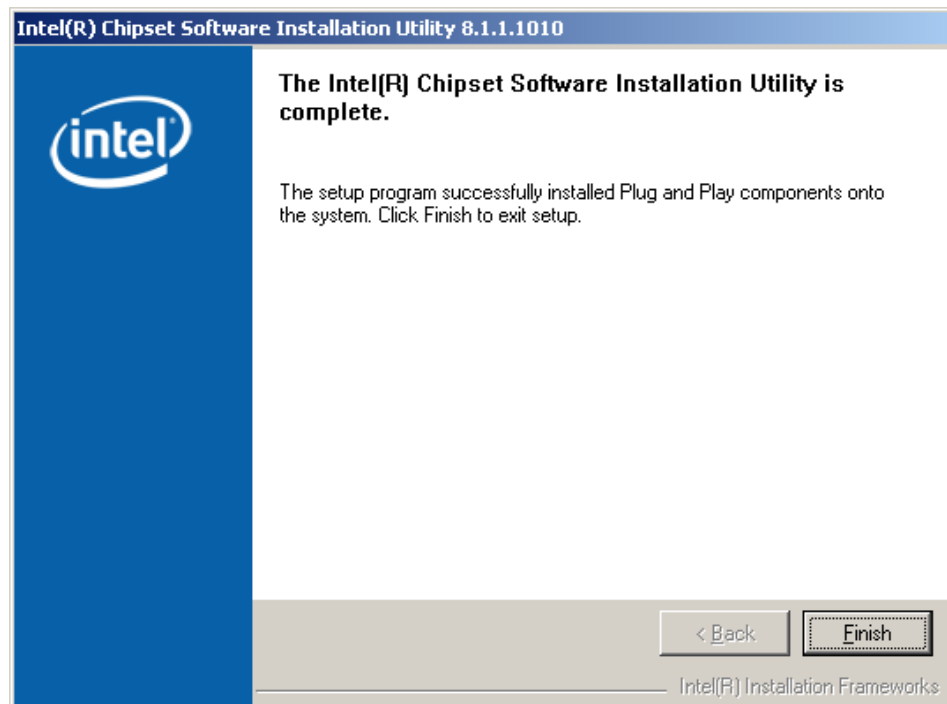


Figure 7-7: Chipset Driver Installation Complete

7.4 Intel Graphics Media Accelerator Driver

To install the chipset driver, please follow the steps below:

Step 1: Select the VGA driver from the list in **Figure 7-2**.

Step 2: A new window opens (**Figure 7-8**).

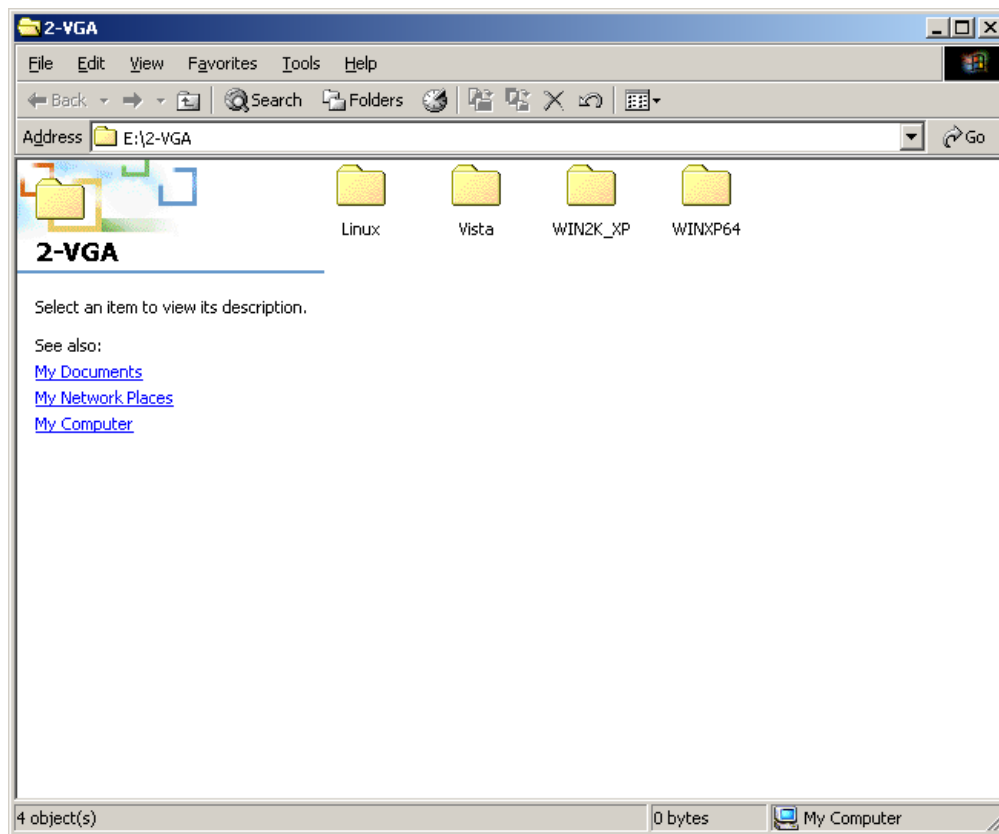


Figure 7-8: Select the Operating System

Step 3: Select the operating system from those shown in **Figure 7-8**.

Step 4: A new window appears (**Figure 7-9**).

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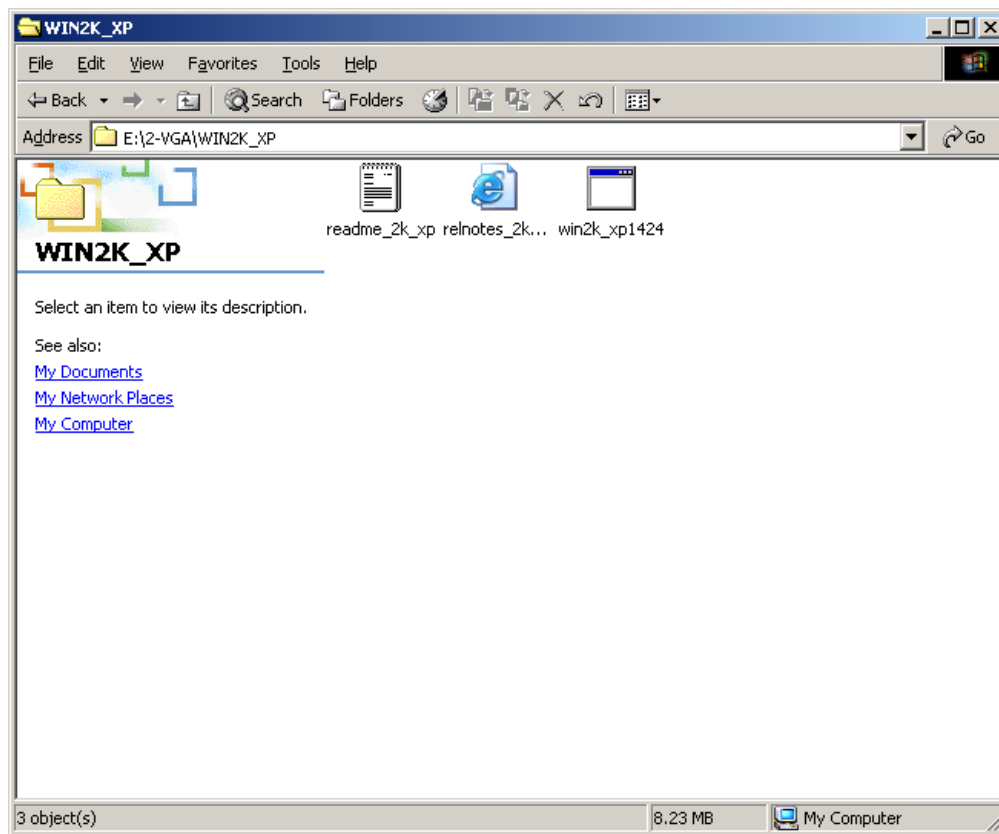


Figure 7-9: VGA Driver

Step 5: Click the installation program icon in **Figure 7-9**.

Step 6: The Readme information file shown in **Figure 7-10** appears.

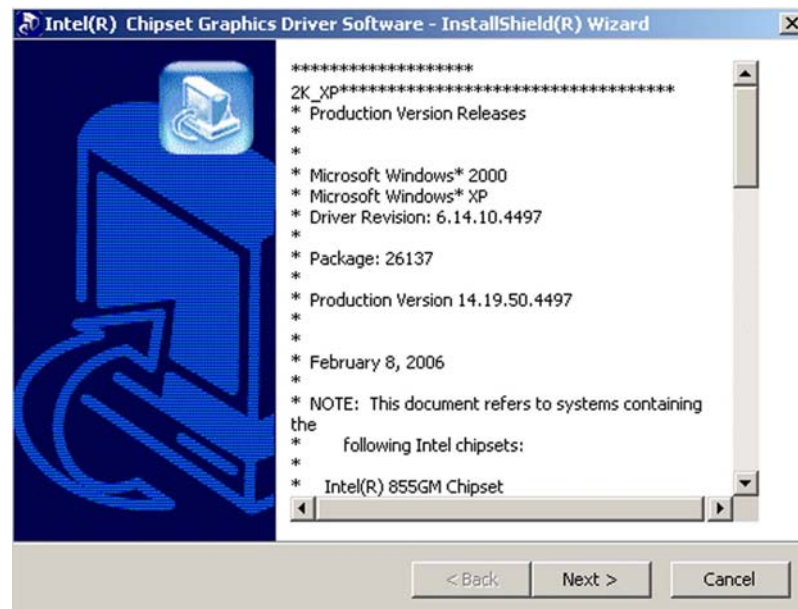


Figure 7-10: GMA Driver Readme File

Step 7: Click **NEXT** to extract the GMA driver files. See **Figure 7-11**.

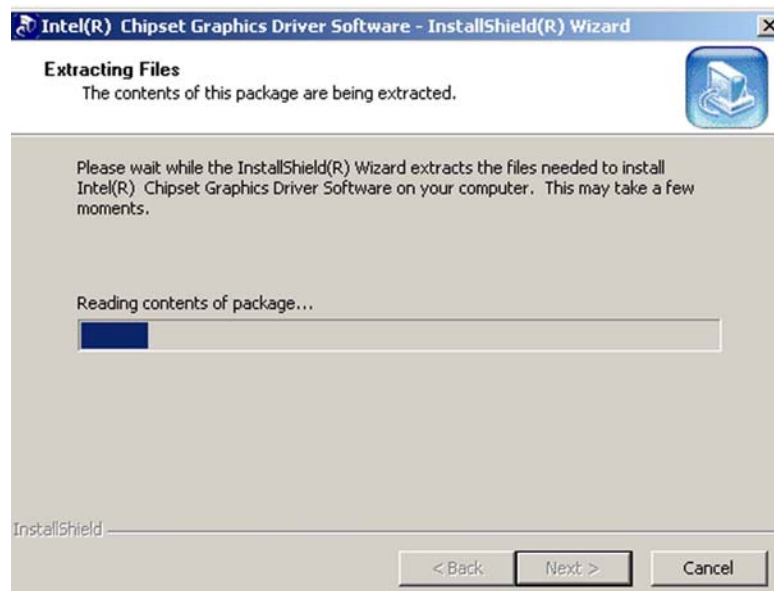


Figure 7-11: GMA Driver File Extraction

Step 8: The welcome screen shown in **Figure 7-12** appears.

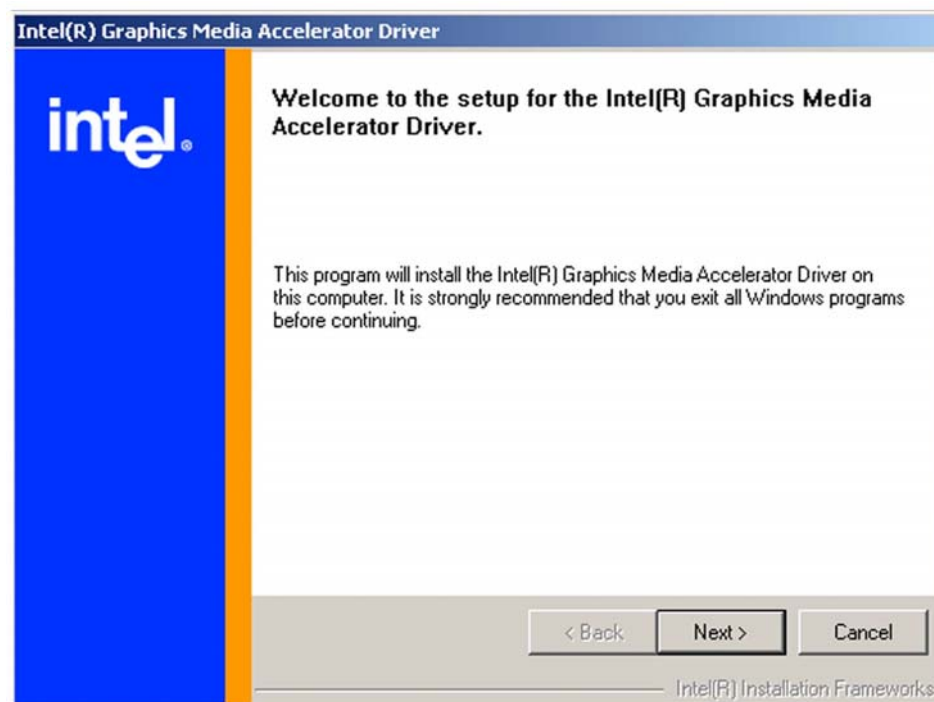


Figure 7-12: GMA Driver Installation Welcome Screen

Step 9: To continue the installation process, click **NEXT**.

Step 10: The license agreement in **Figure 7-13** appears.

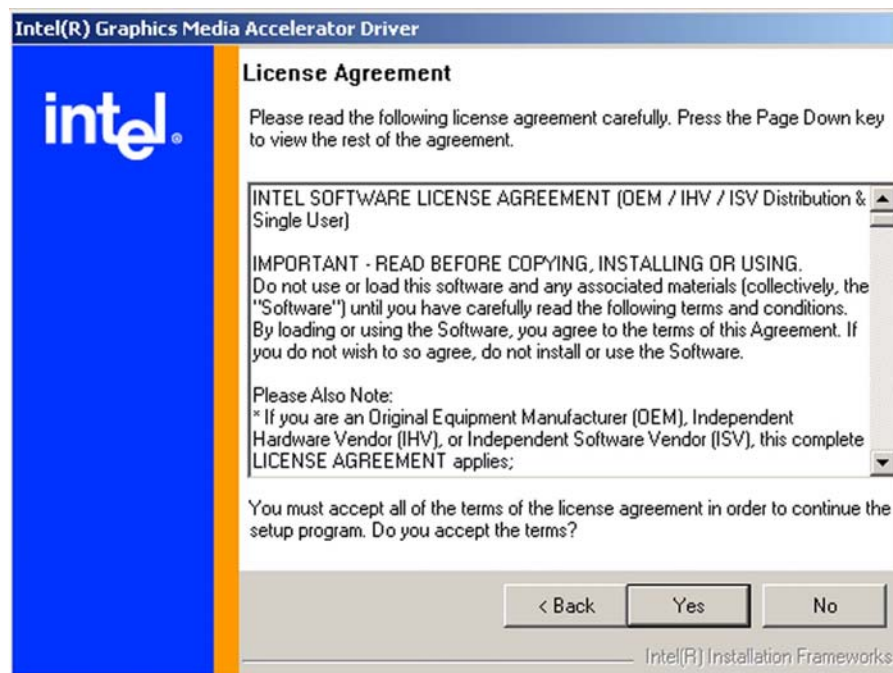


Figure 7-13: GMA Driver License Agreement

Step 11: Click the **YES** in **Figure 7-13** to continue.

Step 12: The installation notice shown in **Figure 7-14** appears.



Figure 7-14: GMA Driver Installing Notice

Step 13: A confirmation screen shown in **Figure 7-15** appears.

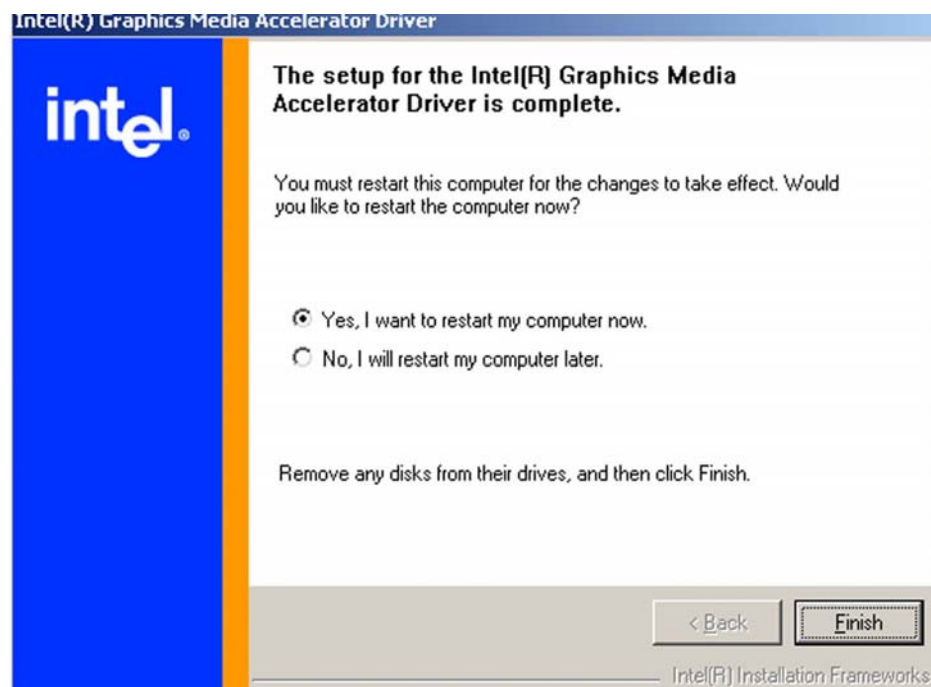


Figure 7-15: GMA Driver Installation Complete

Step 14: After selecting when to restart the computer in **Figure 7-15**, click **FINISH**.

7.5 Broadcom LAN Driver (for GbE LAN) Installation

To install the Broadcom LAN driver, please follow the steps below.

Step 1: Open **Windows Control Panel** (**Figure 7-16**).

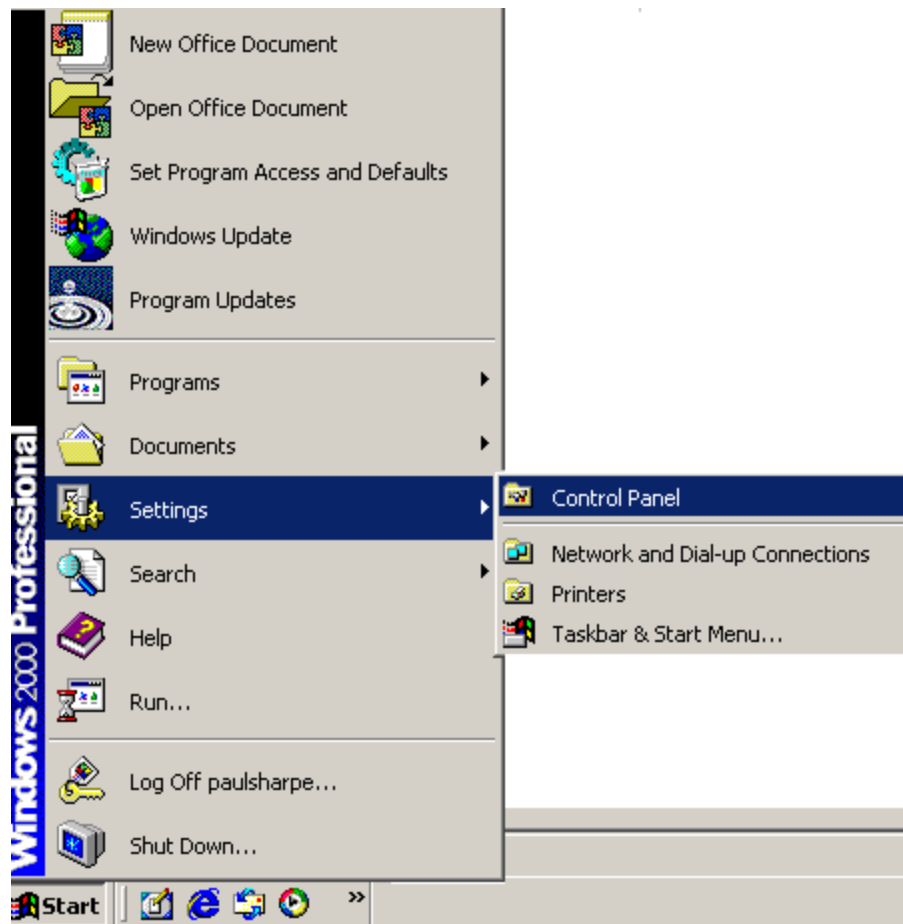


Figure 7-16: Access Windows Control Panel

Step 2: Double click the **System** icon (Figure 7-17).

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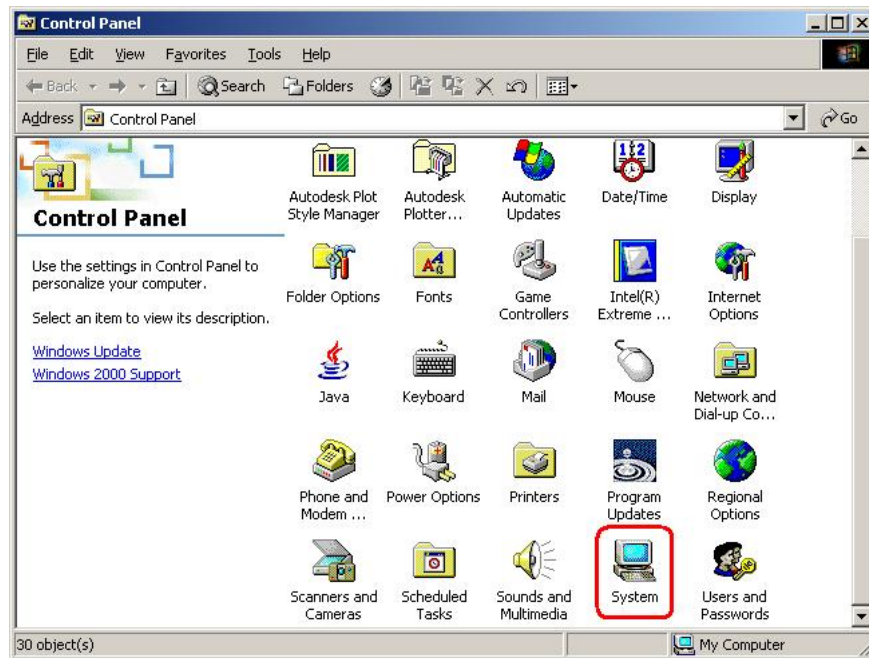


Figure 7-17: Double Click the System Icon

Step 3: Double click the **Device Manager** tab (Figure 7-18).

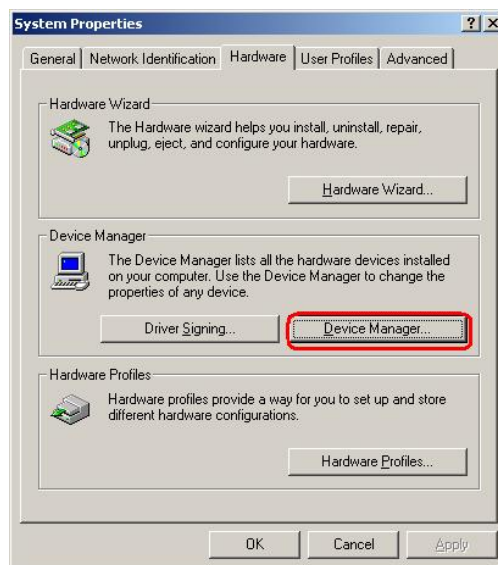


Figure 7-18: Double Click the Device Manager Tab

Step 4: A list of system hardware devices appears (Figure 7-19).

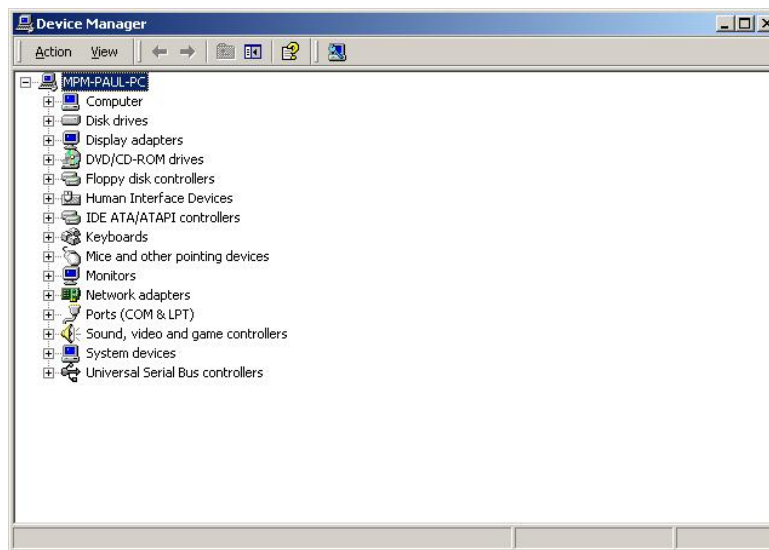


Figure 7-19: Device Manager List

Step 5: Double click the listed device that has question marks next to it. (This means Windows does not recognize the device).

Step 6: The **Device Driver Wizard** appears (**Figure 7-20**). Click **NEXT** to continue.

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Figure 7-20: Search for Suitable Driver

Step 7: Select “Specify a Location” in the **Locate Driver Files** window (Figure 7-21).

Click **NEXT** to continue.



Figure 7-21: Locate Driver Files

Step 8: Select the proper OS folder under the “X:\3-LAN\BROADCOM BCM57xx Drivers” directory (**Figure 7-22**) in the location browsing window, where “X:\” is the system CD drive.

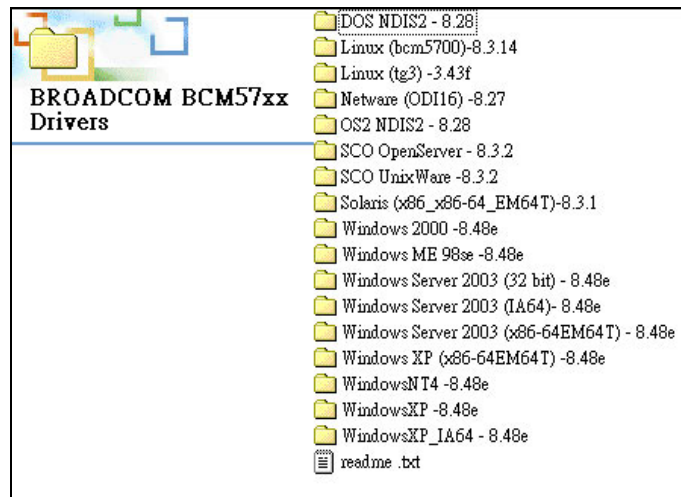


Figure 7-22: Location Browsing Window

Step 9: Click **OK** to continue. A driver files location menu window appears. Click **NEXT** to continue. The driver is installed.

7.6 Realtek HD Audio Driver (ALC883) Installation

To install the Realtek High Definition (HD) Audio driver, please follow the steps below.

7.6.1 BIOS Setup

Step 1: Enter the BIOS setup. To do this, reboot the system and press **DEL** during POST.

Step 2: Go to the Southbridge Configuration menu. Set the **Audio Controller** option to [Azalia]. See **Chapter 6** for details.

Step 3: Press **F10** to save the changes and exit the BIOS setup. The system reboots.

7.6.2 Driver Installation

Step 1: Insert the CD that came with the package.

Step 2: From the main driver menu, navigate to **X:\4-AUDIOAC-KIT883HD\Windows** (or other appropriate OS). **X:** represents the system CD drive. A new window appears showing the folder contents (**Figure 7-23**).

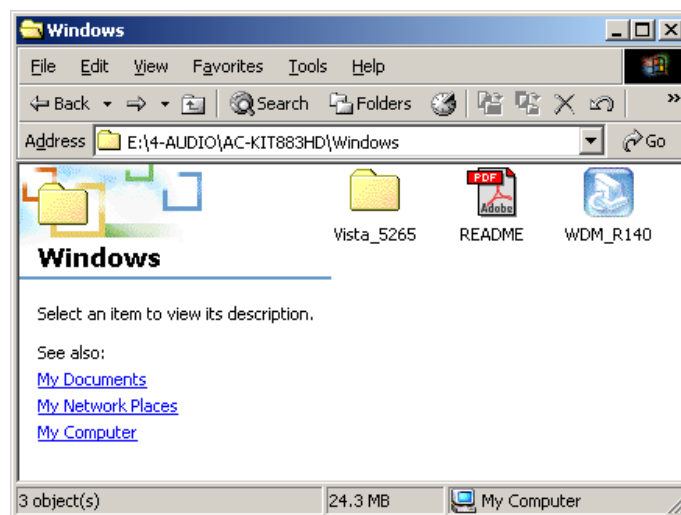


Figure 7-23: 4-AUDIOAC-KIT883HD\Windows Folder

Step 3: Double-click the **WDM_R140** icon to begin the driver installation process.

Step 4: Once the **WDM_R140** icon is double clicked, the contents of the installation package are extracted. See **Figure 7-24**.

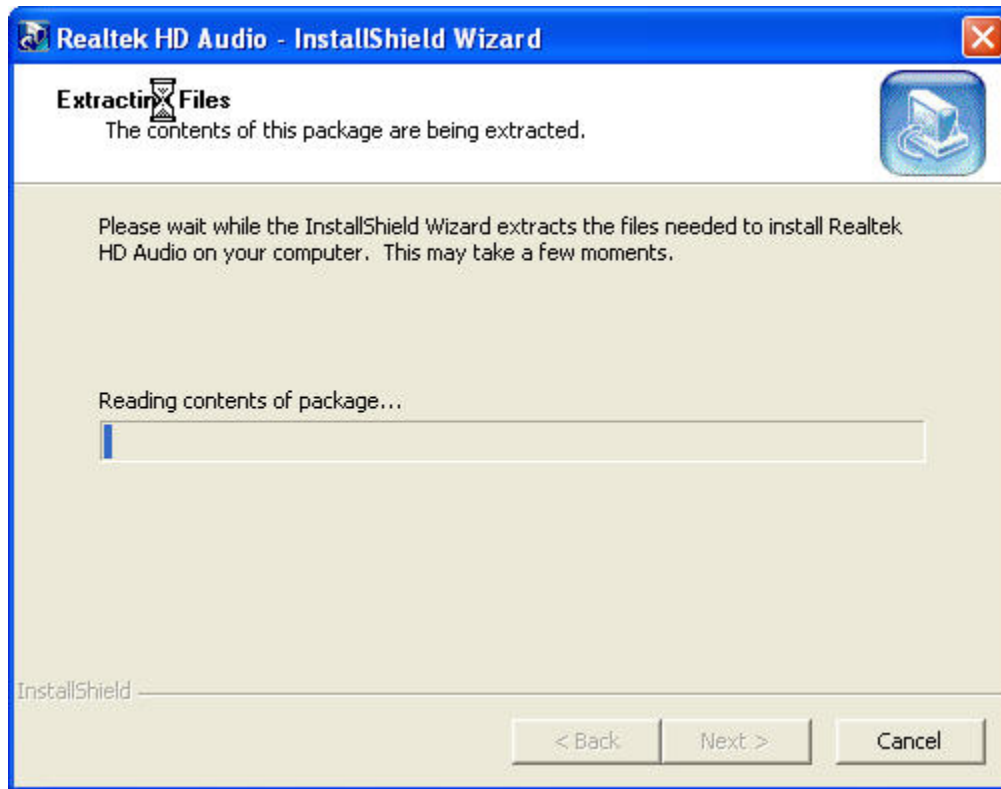


Figure 7-24: HD Audio Driver Setup Extracting Files

Step 5: The **Welcome** screen appears. Click **NEXT**. See **Figure 7-25**.

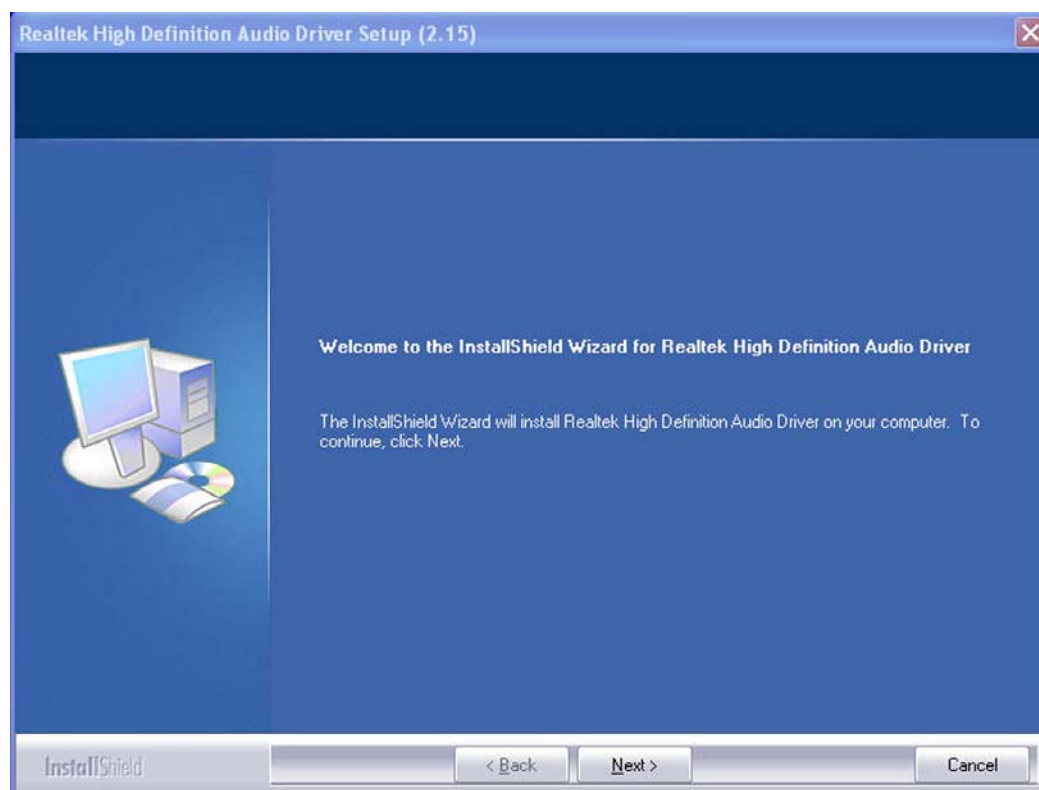


Figure 7-25: HD Audio Driver Setup Welcome Screen

Step 6: The driver is automatically installed.

Step 7: After the driver installation process is complete, a confirmation screen shown in **Figure 7-26** appears.

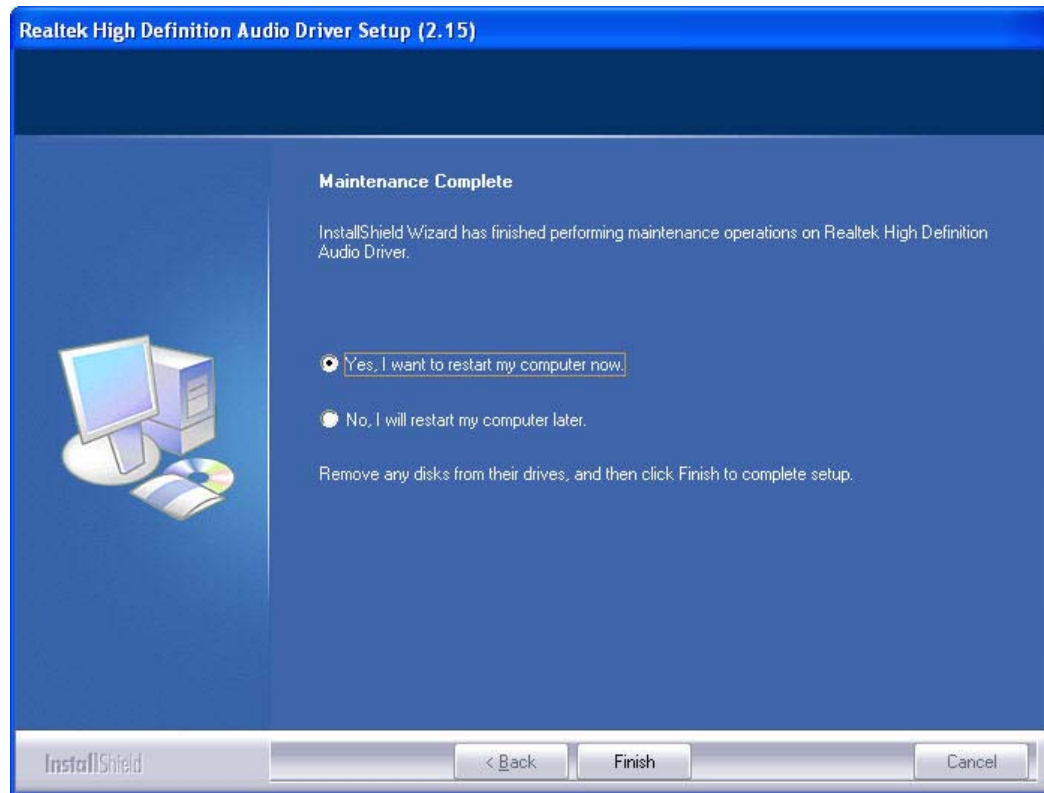


Figure 7-26: HD Audio Driver Installation Complete

Step 8: The confirmation screen shown in **Figure 7-26** allows you to restart the computer immediately after the installation is complete or to restart the computer later. For the settings to take effect the computer must be restarted. Once you have decided when to restart the computer, click the **“FINISH”** button.

7.7 Realtek AC`97 Audio Driver (ALC665) Installation

To install the Realtek AC `97 audio driver, please follow the steps below.

7.7.1 BIOS Setup

- Step 1:** Enter the BIOS setup. To do this, reboot the system and press **DEL** during POST.
- Step 2:** Go to the Southbridge Configuration menu. Set the **Audio Controller** option to [AC`97]. See **Section 6.7.2** for details.
- Step 3:** Press **F10** to save the changes and exit the BIOS setup. The system reboots.

7.7.2 Driver Installation

- Step 1:** Insert the CD that came with the package.
- Step 2:** From the main driver menu, navigate to **X:\4-AUDIO\AC-KIT08R\Windows** (or other appropriate OS). **X:** represents the system CD drive. A new window appears showing the folder contents (**Figure 7-27**).

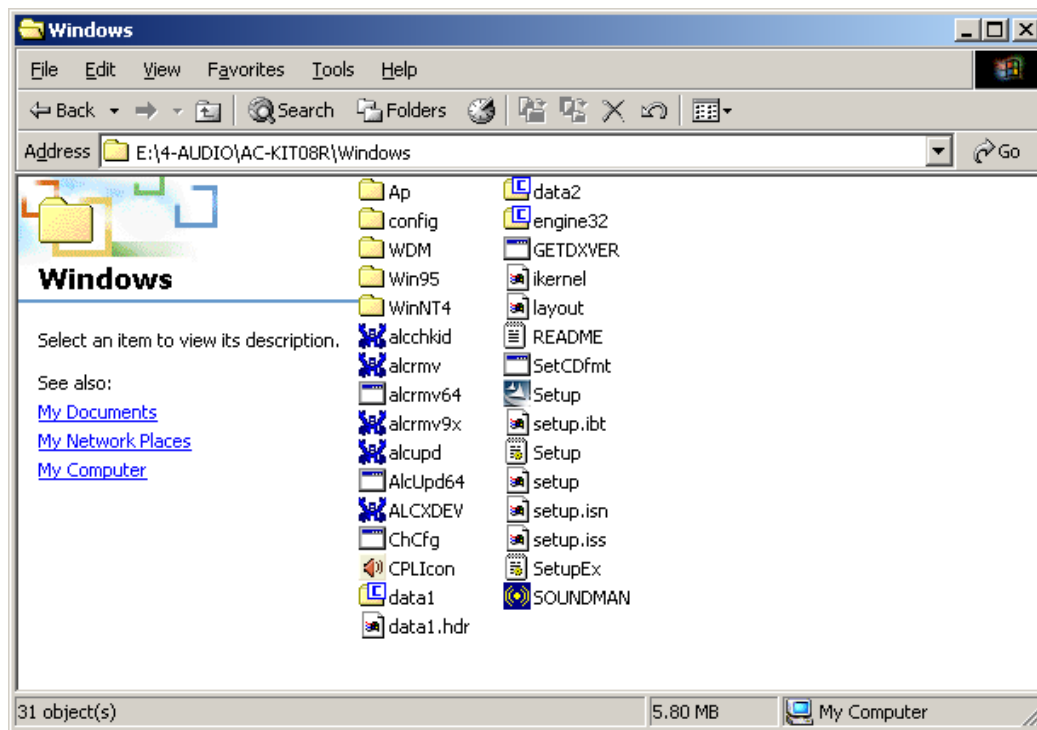


Figure 7-27: CD 4-AUDIO\AC-KIT08R\Windows Folder

Step 3: Double-click the **Setup.exe** file to begin the driver installation process.

Step 4: Once you double click the **Setup** icon, the install shield wizard for the audio driver starts. See **Figure 7-28**.

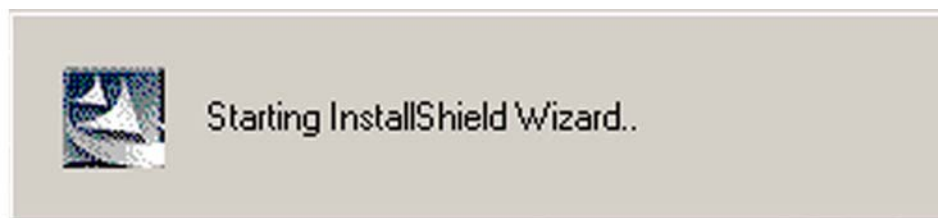


Figure 7-28: AC`97 Audio Driver Install Shield Wizard Starting

Step 5: The Realtek Audio Setup prepares the install shield to guide you through the rest of the setup process. See **Figure 7-25**.

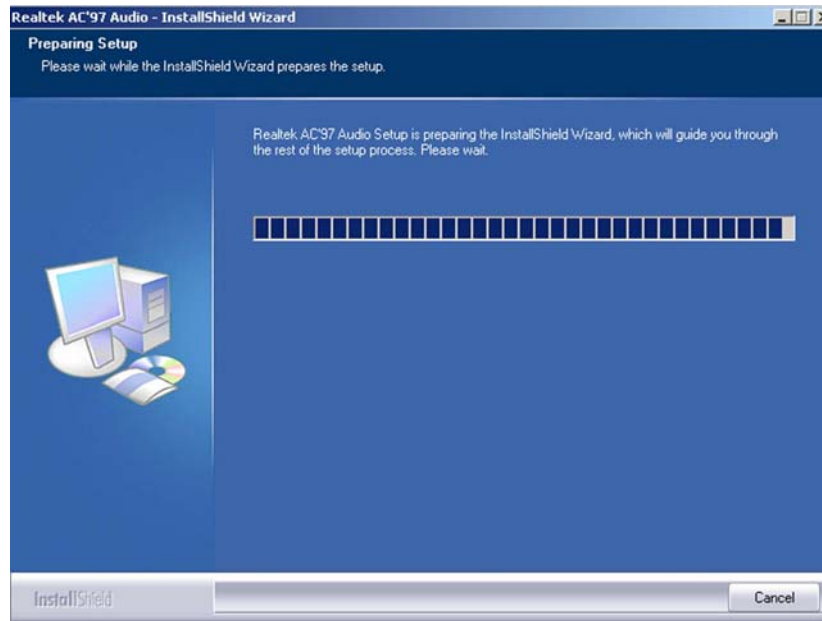
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Figure 7-29: AC'97 Audio Driver Setup Preparation

Step 6: After the install shield is prepared, the welcome screen shown in **Figure 7-30** appears. To continue the installation process, click the “**NEXT**” button. The install shield starts to configure the new software as shown in **Figure 7-31**.

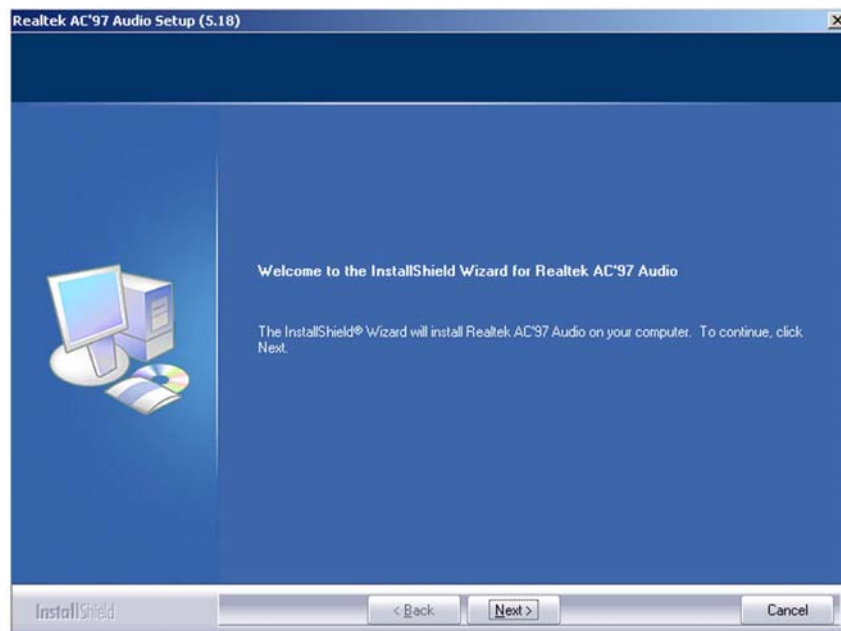


Figure 7-30: AC'97 Audio Driver Welcome Screen

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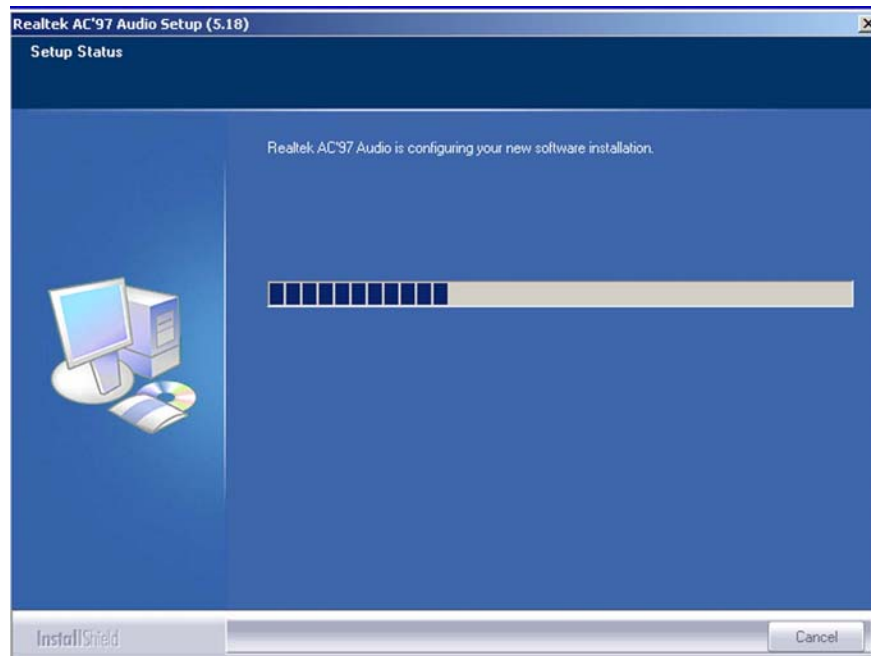


Figure 7-31: AC'97 Audio Driver Software Configuration

Step 7: At this stage the “**Digital Signal Not Found**” screen appears (**Figure 7-32**). To continue the installation process, click the “**YES**” button.



Figure 7-32: AC`97 Audio Driver Digital Signal

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Step 8: After clicking the “**YES**” button in **Figure 7-32**, the installation of the driver begins (**Figure 7-33**).

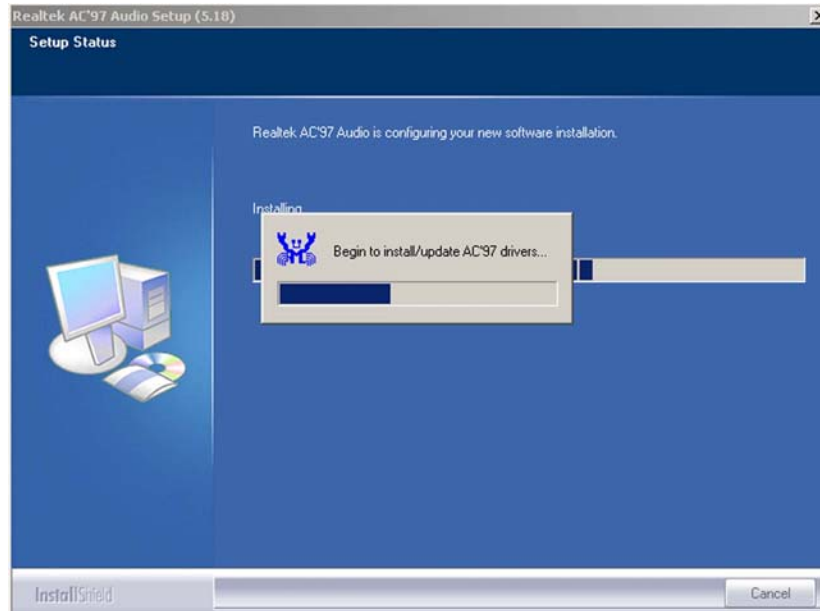


Figure 7-33: AC'97 Audio Driver Installation Begins

Step 9: After the driver installation process is complete, a confirmation screen shown in **Figure 7-34** appears.

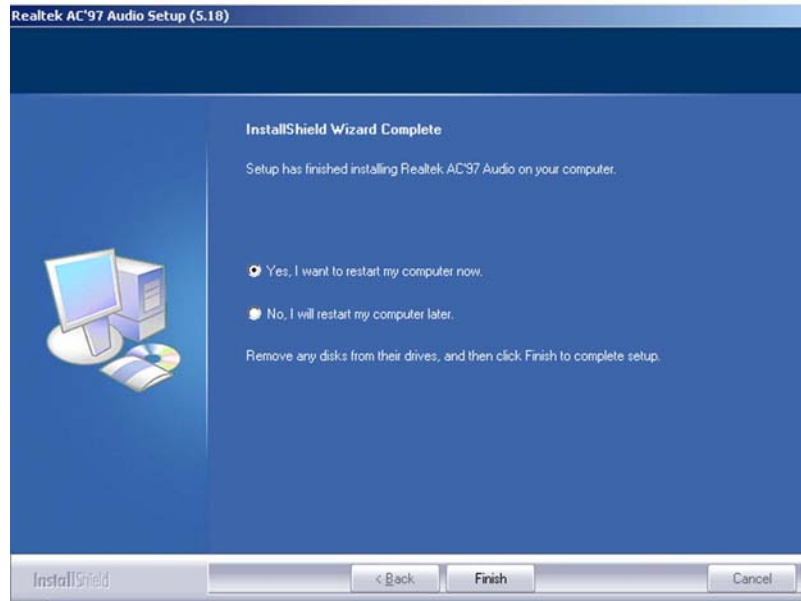


Figure 7-34: AC'97 Audio Driver Installation Complete

Step 10: The confirmation screen shown in **Figure 7-34** allows you to restart the computer immediately after the installation is complete or to restart the computer later. For the settings to take effect the computer must be restarted. Once you have decided when to restart the computer, click the **"FINISH"** button.

7.8 Intel Matrix Storage Manager Installation

To install the Intel® Matrix Storage Manager driver, please follow the steps below:

Step 1: Select SATA from the list in **Figure 7-2**.

Step 2: A new window opens (**Figure 7-35**).

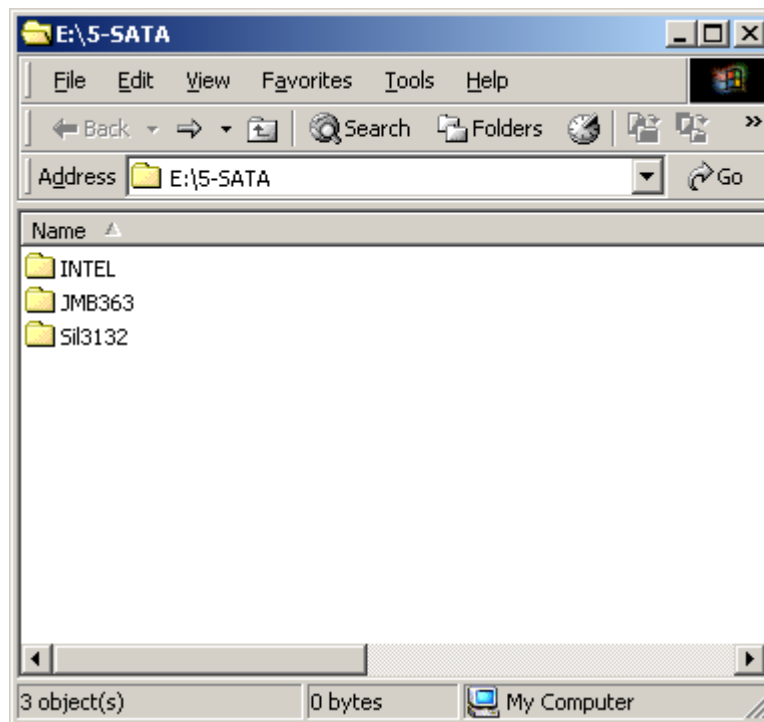


Figure 7-35: SATA RAID Driver Installation Program

Step 3: Double-click the **INTEL** folder.

Step 4: Double-click the **iata62_cd.exe** program icon in **Figure 7-36**.

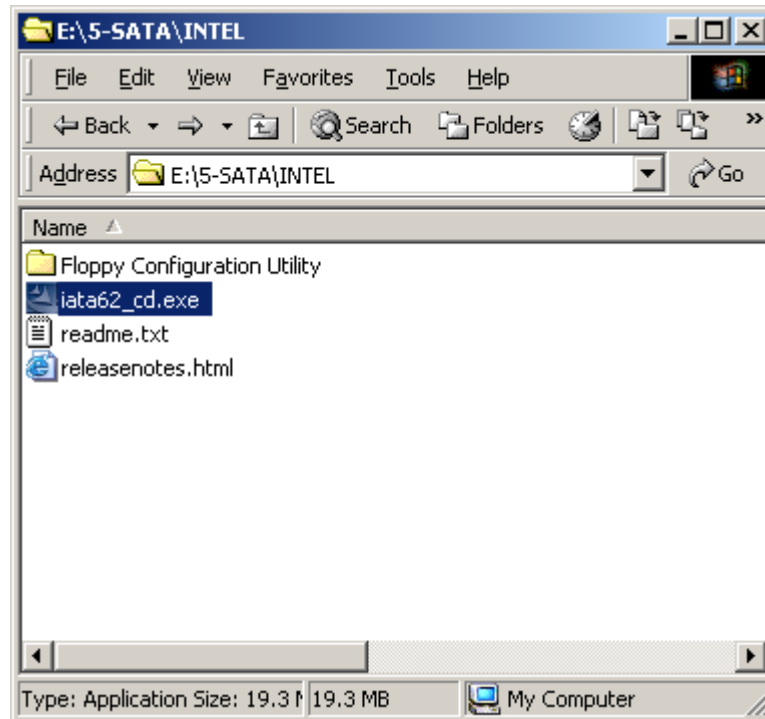


Figure 7-36: SATA RAID Setup Program Icon

Step 5: Figure 7-37 shows the **InstallShield Wizard** preparing to guide the user through the rest of the process.

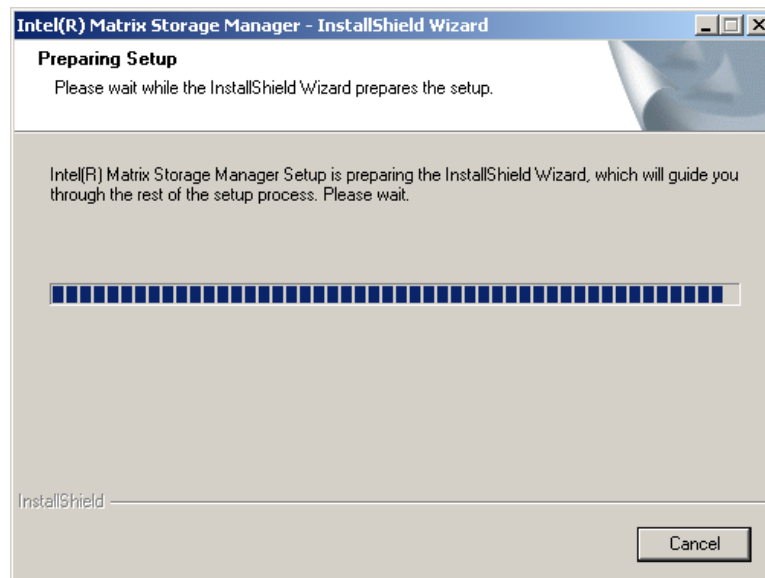


Figure 7-37: InstallShield Wizard Setup Screen

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Step 6: Figure 7-38 shows the Matrix Storage Manager software configuring the installation process.

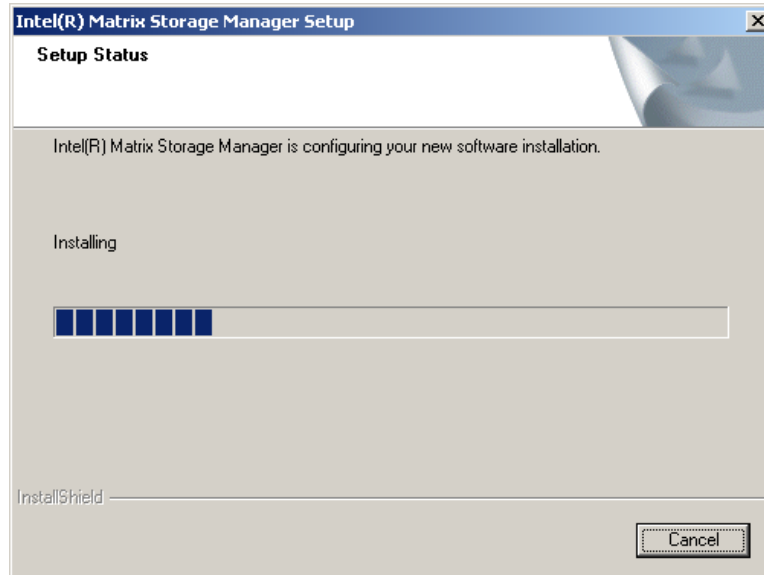


Figure 7-38: Matrix Storage Manager Setup Screen

Step 7: Figure 7-39 shows the **Matrix Storage Manager** welcome screen.

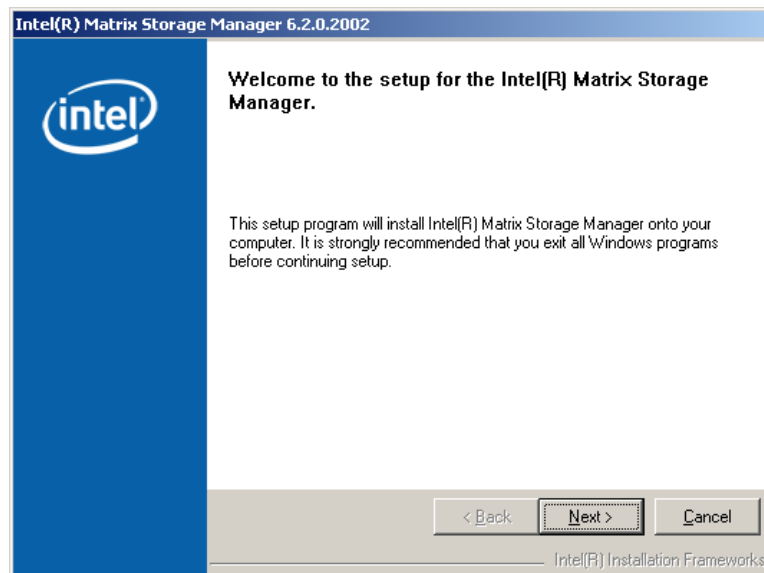


Figure 7-39: Matrix Storage Manager Welcome Screen

Step 8: Click **NEXT** and a warning appears (**Figure 7-40**). Read the warning carefully and decide whether or not to continue the installation process.

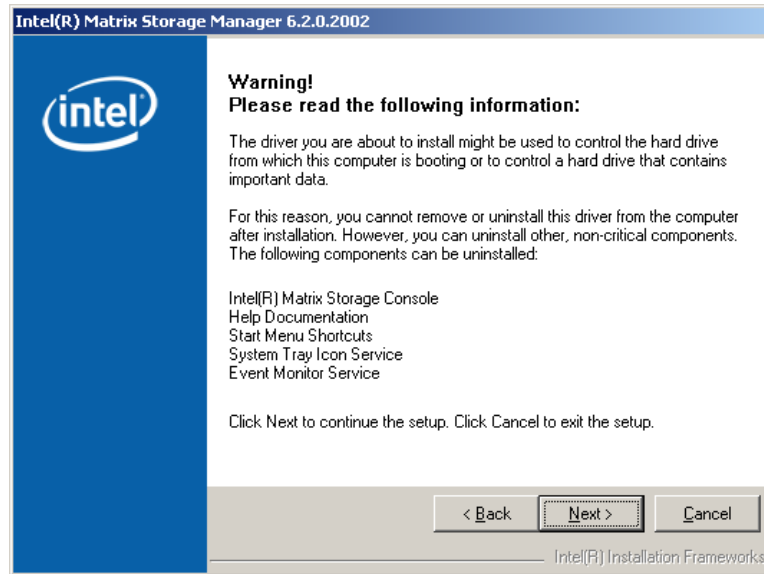


Figure 7-40: Matrix Storage Manager Warning Screen

Step 9: Click **NEXT** and a license agreement appears (**Figure 7-41**).

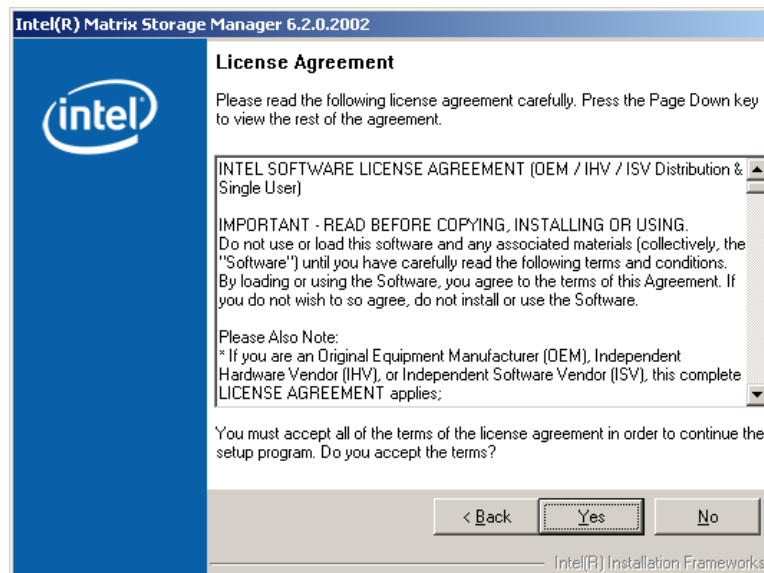


Figure 7-41: Matrix Storage Manager License Agreement

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Step 10: Read the license agreement. To accept the terms and conditions stipulated in the license agreement shown, click **YES** and the Readme information file shown in **Figure 7-42** appears.

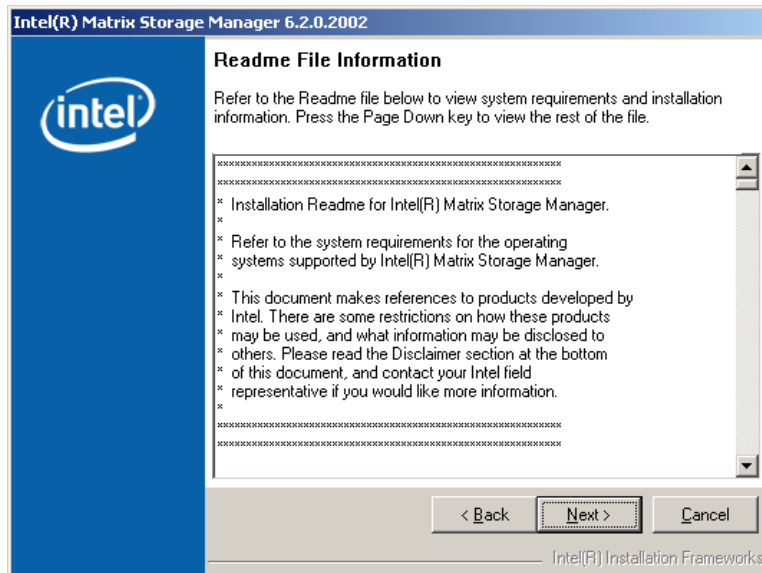


Figure 7-42: Matrix Storage Manager Readme File

Step 11: Read the Readme file information and click **NEXT**.

Step 12: After the driver installation process is complete, a confirmation screen appears (Figure 7-43).

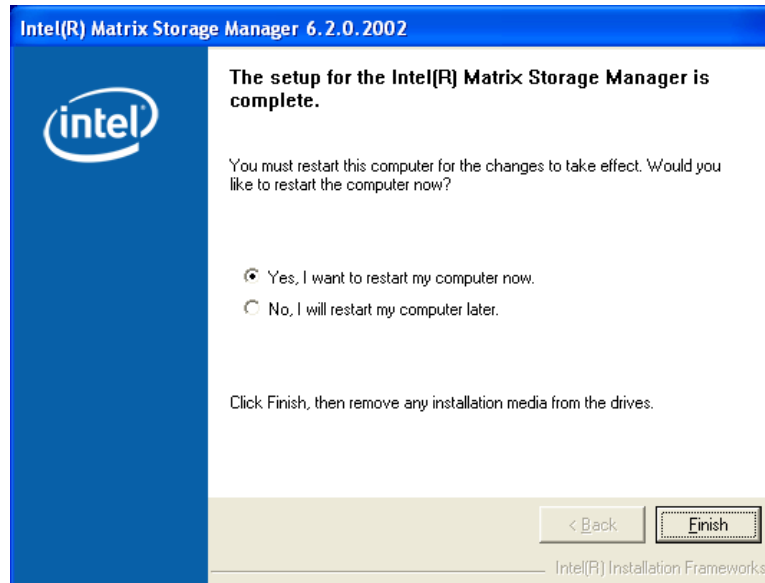


Figure 7-43: Matrix Storage Manager Setup Complete

Step 13: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

Appendix

A

BIOS Options

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Appendix

B

DIO Interface

B.1 DIO Interface Introduction

The DIO connector on the PCIE-9452 is interfaced to GIO ports on the iTE Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.



NOTE:

For further information, please refer to the datasheet for the iTE Super I/O chipset.

B.2 DIO Connector Pinouts

The following table describes how the DIO connector pins are connected to the Super I/O GPIO port 1.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

B.3 Assembly Language Samples

B.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

MOV	AX, 6F08H	Sets the digital port as input
INT	15H	Initiates the INT 15H BIOS call

B.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

MOV	AX, 6F09H	Sets the digital port as output
MOV	BL, 09H	
INT	15H	Initiates the INT 15H BIOS call



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Appendix

C

Watchdog Timer


NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table C-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

**NOTE:**

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

; INITIAL TIMER PERIOD COUNTER

;

W_LOOP:

```
MOV    AX, 6F02H    ;setting the time-out value
MOV    BL, 30        ;time-out value is 48 seconds
INT     15H
```

;

; ADD THE APPLICATION PROGRAM HERE

;

```
CMP     EXIT_AP, 1    ;is the application over?
JNE     W_LOOP        ;No, restart the application
```

```
MOV     AX, 6F02H    ;disable Watchdog Timer
MOV     BL, 0        ;
INT     15H
```

;

; EXIT ;



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Appendix

D

Address Mapping

D.1 Address Map

I/O address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-043	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F7	Primary IDE Channel
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	Intel Graphics Controller
3C0-3DF	Intel Graphics Controller
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table D-1: IO Address Map

D.2 1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

Table D-2: 1st MB Memory Address Map

D.3 IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI
IRQ2	Available	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN/USB2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

Table D-3: IRQ Mapping Table

D.4 DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Table D-4: IRQ Mapping Table



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Appendix

E

Intel® Matrix Storage Manager

E.1 Introduction

The Intel® ICH7R chipset can provide data protection for serial ATA (SATA) disks via the Intel® Matrix Storage Manager using one of three fault-tolerant RAID levels: RAID 1, 5 or 10. When using two hard drives, matrix RAID allows RAID 0 and RAID 1 functions to be combined, where critical files can be stored on RAID 1, and RAID 0 can be used for non-critical items such as software. RAID 5 and RAID 0 can be combined to provide higher performance, capacity, and fault tolerance.



CAUTION!

A configured RAID volume (which may consist of multiple hard drives) appears to an operating system as a contingent storage space. The operating system will not be able to distinguish the physical disk drives contained in a RAID configuration.

E.1.1 Precautions

One key benefit a RAID configuration brings is that a single hard drive can fail within a RAID array without damaging data. With RAID1 array, a failed drive can be replaced and the RAID configuration restored.



WARNING!

Irrecoverable data loss occurs if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.

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CAUTION!

Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

E.2 Features and Benefits

- Supports RAID levels 0, 1, 5 and 10
- Supports connectivity to two or more disk drives
- Supported Operating Systems include: Windows XP, Windows Server 2003 and Windows Vista

E.3 Accessing the Intel® Matrix Storage Manager

To access the Intel® Matrix Storage Manager, please follow the steps below.

Step 1: Connect SATA drives to the system. Connect two or more SATA drives to the system. Make sure the drives have the same capacity, are the same type and have the same speed.



NOTE:

Make sure the SATA drives are EXACTLY the same when they are configured in a RAID configuration. If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

Step 2: Enable SATA drives in BIOS. Start the computer and access the **BIOS** setup program. Enable **SATA** support for all IDE devices. Refer to the applicable BIOS configuration section in this user manual.

- Step 3: Save and Exit BIOS.** After the **SATA** support option is enabled, save and exit the **BIOS**.
- Step 4: Reboot the system.** Reboot the system after saving and exiting the **BIOS**.
- Step 5: Press Ctrl+I.** During the system boot process, press **Ctrl+I** when prompted to enter the RAID configuration software.
- Step 6: Configure the RAID settings.** Use the Intel® Matrix Storage Manager to configure the RAID array. Brief descriptions of configuration options are given below.
- Step 7: Install the OS.** After the RAID array has been configured, install the OS. To do this, please refer to the documentation that came with the OS.

E.4 RAID Configuration

E.4.1 Creating a RAID Volume



WARNING!

All data previously stored on the member drives of a RAID configuration are destroyed during the RAID initialization process. If “used” drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

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Step 1: Select “Create RAID Volume.” Use the arrow keys to highlight **Create RAID Volume** and press **ENTER**. See Figure E-1.

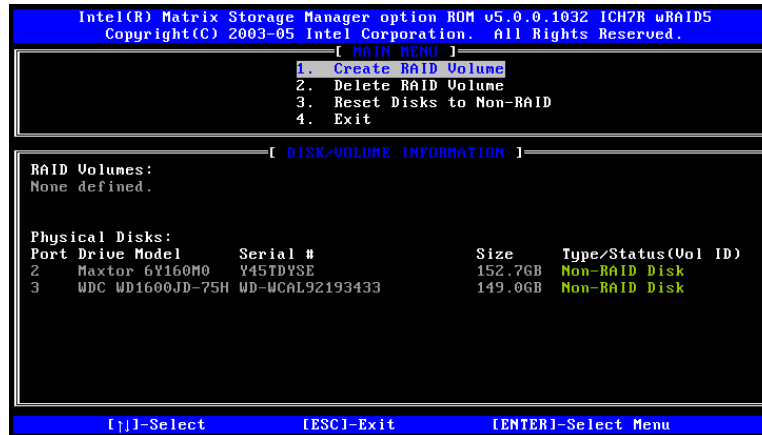


Figure E-1: Matrix Storage Manager Main Menu

Step 2: Name the RAID volume. Enter a name for the RAID volume, or press **ENTER** to accept the default volume name. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array. See Figure E-2.



Figure E-2: Create RAID Volume Name

Step 3: Choose the RAID level. Select a RAID level from the list. RAID levels include RAID 0, 1, 5 and 10. See Figure E-3.



NOTE:

RAID 0 and RAID1 levels require a minimum of two hard drives.

RAID 10 level requires a minimum of four hard drives.

RAID5 level requires a minimum of three hard drives.

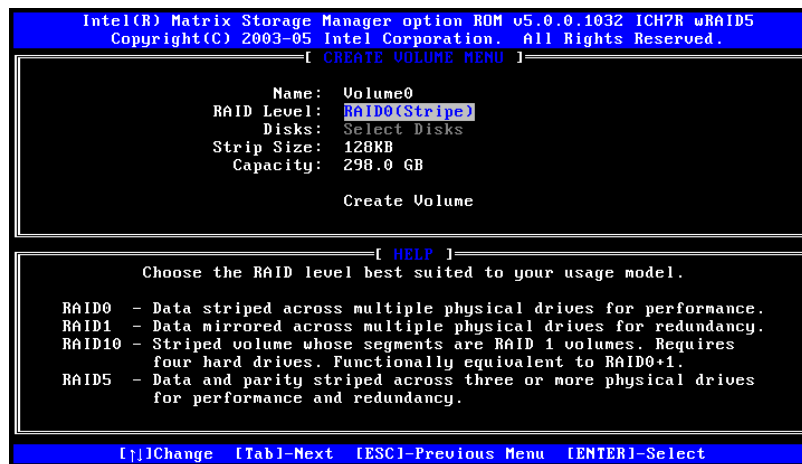


Figure E-3: Choose the Raid Level

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Step 4: Select the Stripe Size. Select a stripe size from the list. See Figure E-4.



Figure E-4: Select the Stripe Size

Step 5: Enter the Volume Capacity. Enter the volume capacity, or press **ENTER** to accept the default capacity. See Figure E-5.

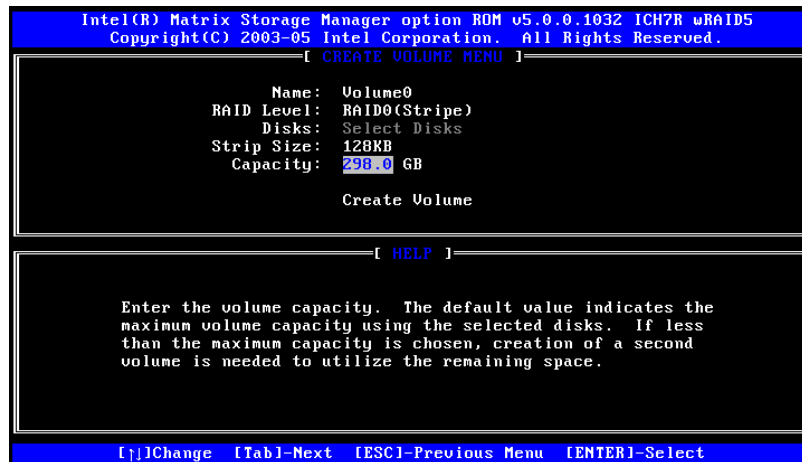


Figure E-5: Enter the Volume Capacity

Step 6: Create the RAID Volume. Press **ENTER** to create the RAID volume as specified.

See Figure E-6.

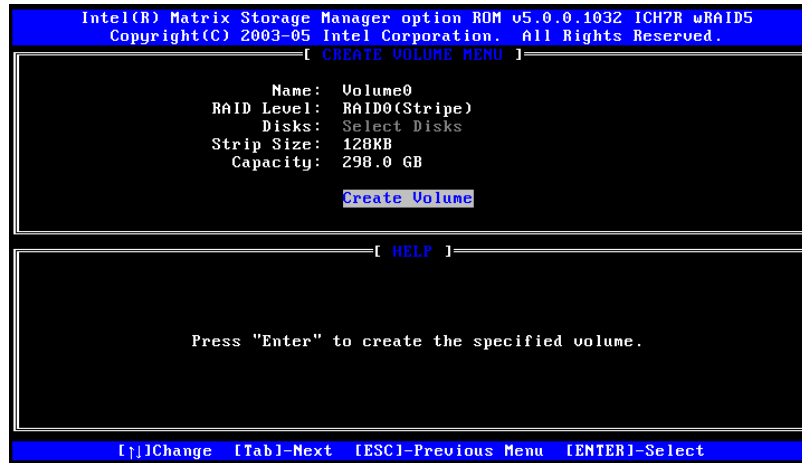


Figure E-6: Create the RAID Volume

Step 7: Create RAID Volume Verification. After reading the warning, press **Y** to create the RAID volume as specified, or **N** to return to the **Create RAID Volume** menu.

See Figure E-7.

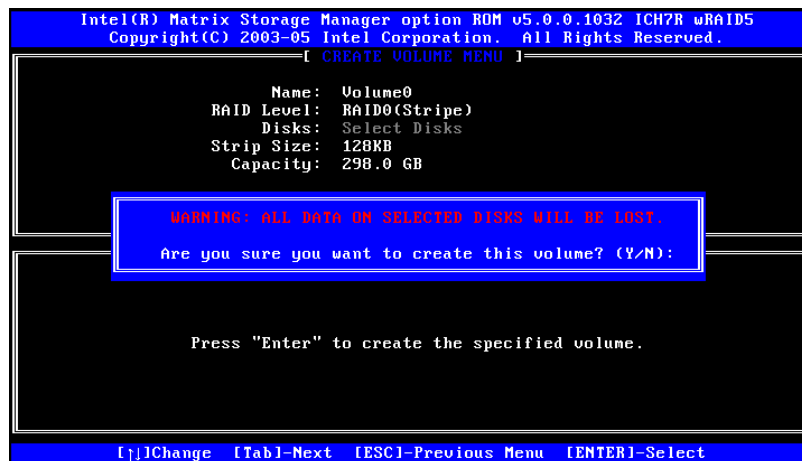


Figure E-7: Create RAID Volume Verification

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E.4.2 Deleting a RAID Volume

**WARNING!**

All data stored on the member drives of a RAID volume are destroyed during the RAID deletion process. Make sure any data to be saved has been moved or backed up before deleting a RAID volume.

Step 1: Select “Delete RAID Volume.” Use the arrow keys to highlight **Delete RAID Volume** and press **ENTER**. See Figure E-8.

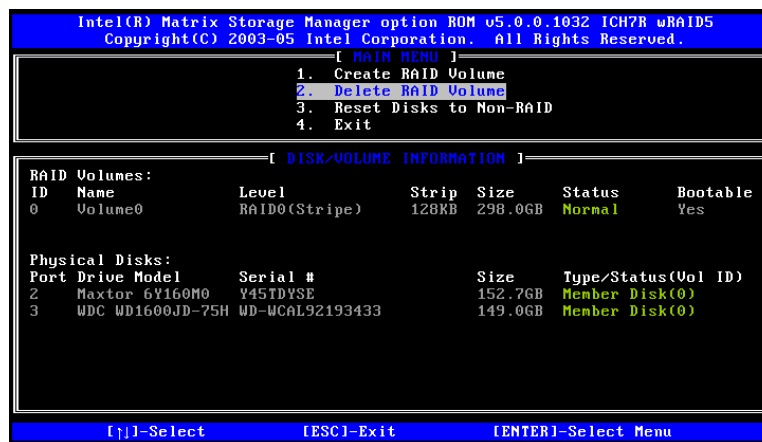


Figure E-8: Delete RAID Volume Menu

Step 2: Select RAID Volume to be Deleted. Use the arrow keys to highlight the RAID volume to be deleted and press **ENTER**. See Figure E-9.

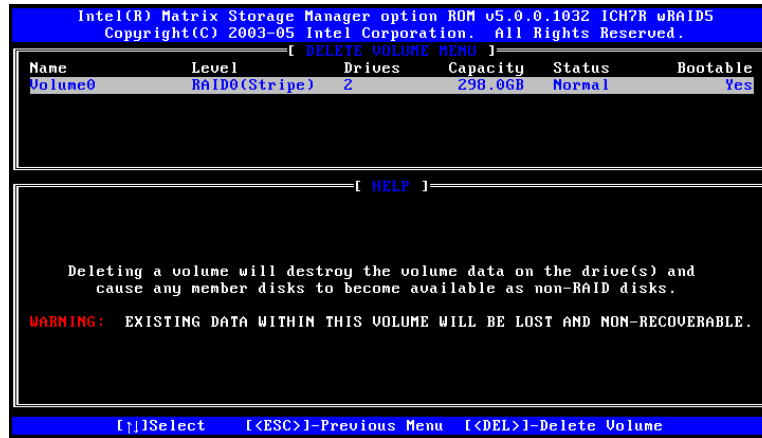


Figure E-9: Select RAID Volume to be Deleted

Step 3: Delete Volume Verification. After reading the warning, press **Y** to delete the specified RAID volume, or **N** to return to the **Delete Volume** menu. See Figure E-10.

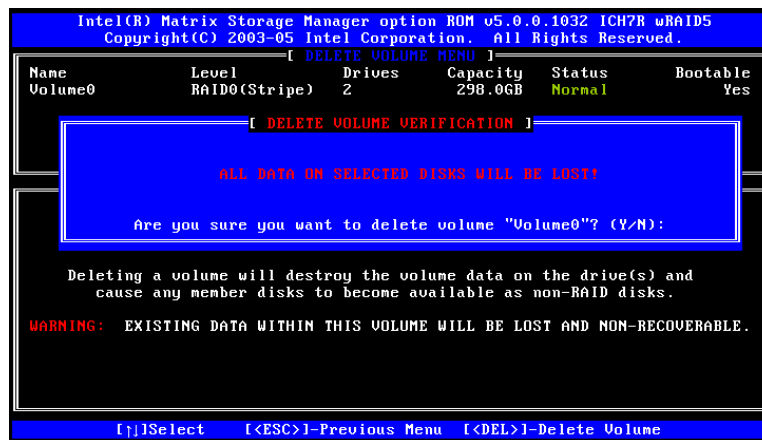


Figure E-10: Delete Volume Verification

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Step 4: Non-RAID Disks. After deleting the RAID volume, the disks belonging to the volume will be shown as non-RAID disks. See Figure E-11.

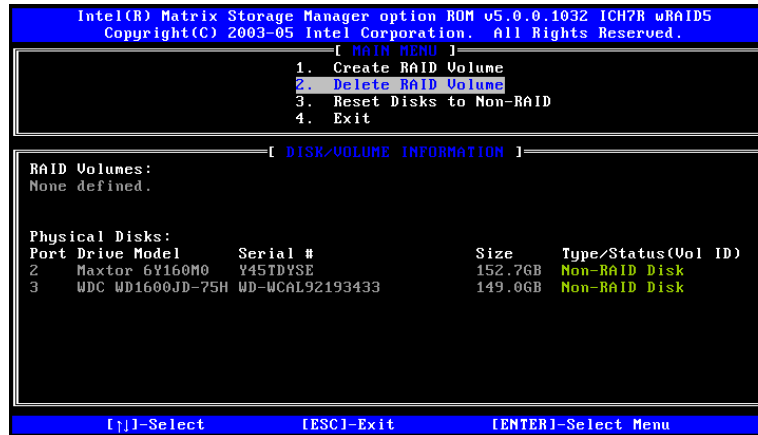


Figure E-11: Non-RAID Disks

E.4.3 Resetting a Disk to Non-RAID



WARNING!

All data stored on the disk drive of a RAID volume is destroyed when resetting it to non-RAID. Make sure any data to be saved has been moved or backed up before resetting a disk to non-RAID.

Step 1: Select “Reset Disk to Non-RAID.” Use the arrow keys to highlight **Reset Disk to Non-RAID** and press **ENTER**. See Figure E-12.

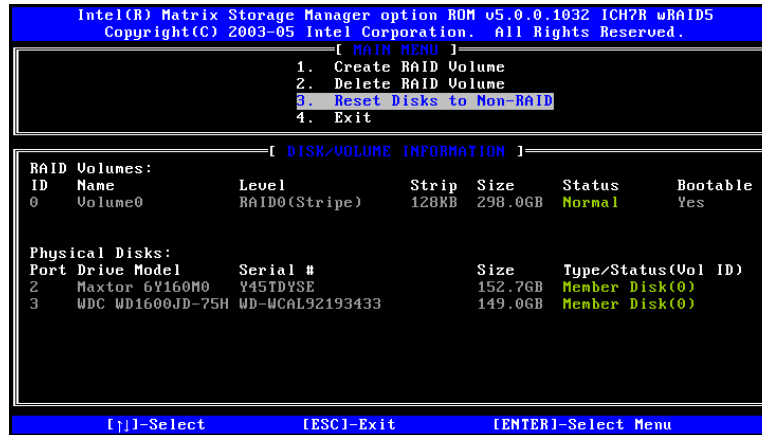


Figure E-12: Reset Disk to Non-RAID Menu

Step 2: Select Disks to Reset. Use the arrow keys to scroll through the disk drives and press **SPACE** to select which drives are to be reset as non-RAID. After all the disks to be reset have been chosen, press **ENTER**. See Figure E-13.

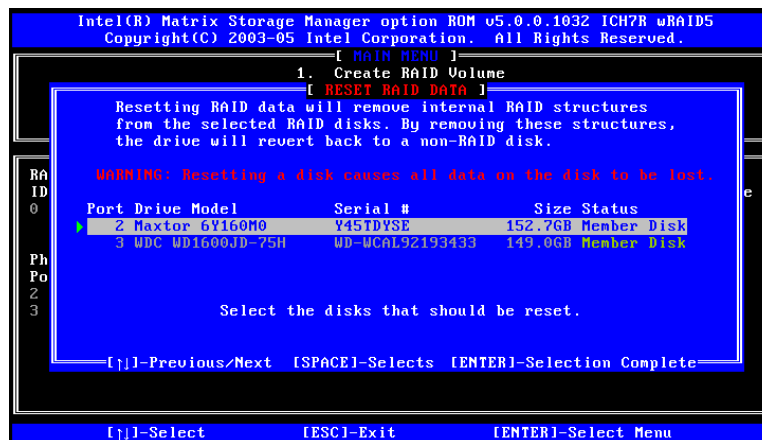


Figure E-13: Select Disk to Reset

PCIE-9452 PICMG 1.3 CPU Card

Step 3: Reset Disk Verification. After reading the warning, press **Y** to reset the selected disks as non-RAID, or **N** to return to the **Reset RAID Data** menu.

See Figure E-14.

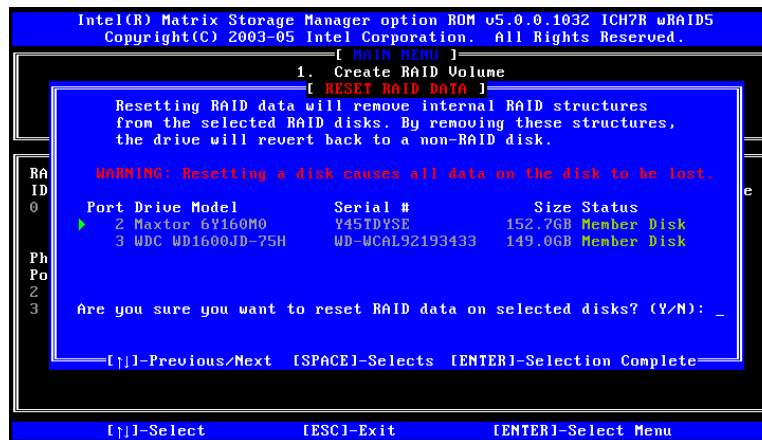


Figure E-14: Reset Disk Verification

Step 4: Disk Drive and RAID Volume Status. After the disk drives have been reset, the **Matrix Storage Manager Main** menu is shown indicating the status of the RAID volumes and disk drives. See Figure E-15.

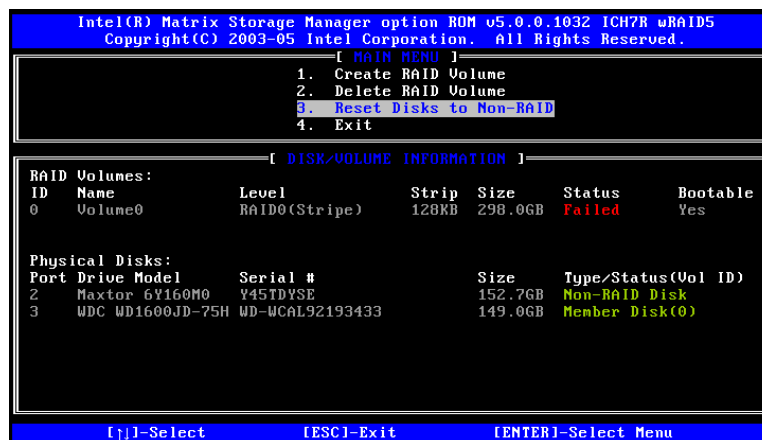


Figure E-15: Disk Drive and RAID Volume Status

E.4.4 Exiting the Matrix Storage Manager

Step 1: Select “Exit.” Use the arrow keys to highlight **Exit** and press **ENTER**.

See Figure E-16.

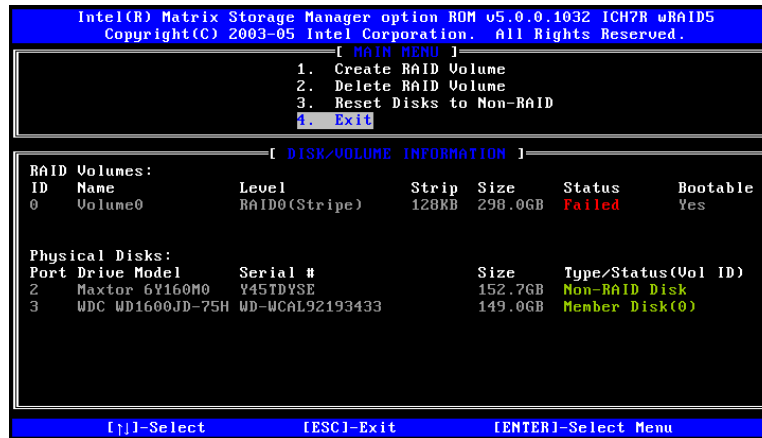


Figure E-16: Exit Menu

Step 2: Exit Verification. Press **Y** to exit the **Matrix Storage Manager**, or **N** to return to the **Main** menu. See Figure E-17.

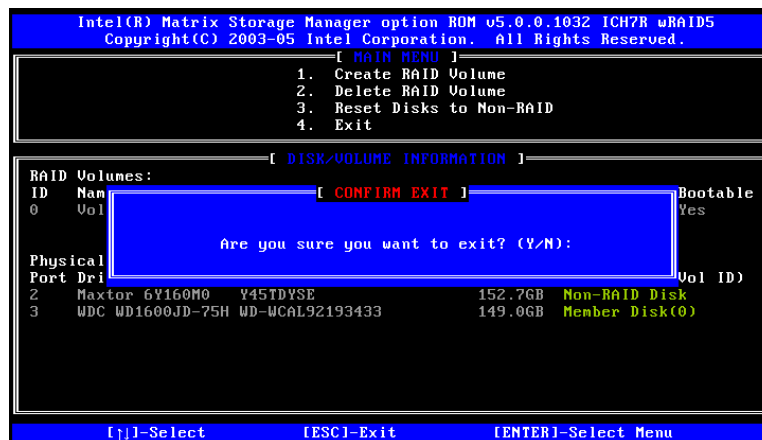


Figure E-17: Exit Verification

Appendix

F

Hazardous Materials Disclosure

F.1 Hazardous Material Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

PCIE-9452 PICMG 1.3 CPU Card

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	x	O	O	O	O	x
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O
<p>O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006</p> <p>X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006</p>						

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O
<p>O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。</p>						

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